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26 Sept
20 Oct
27 "
1804.
17 Feb.

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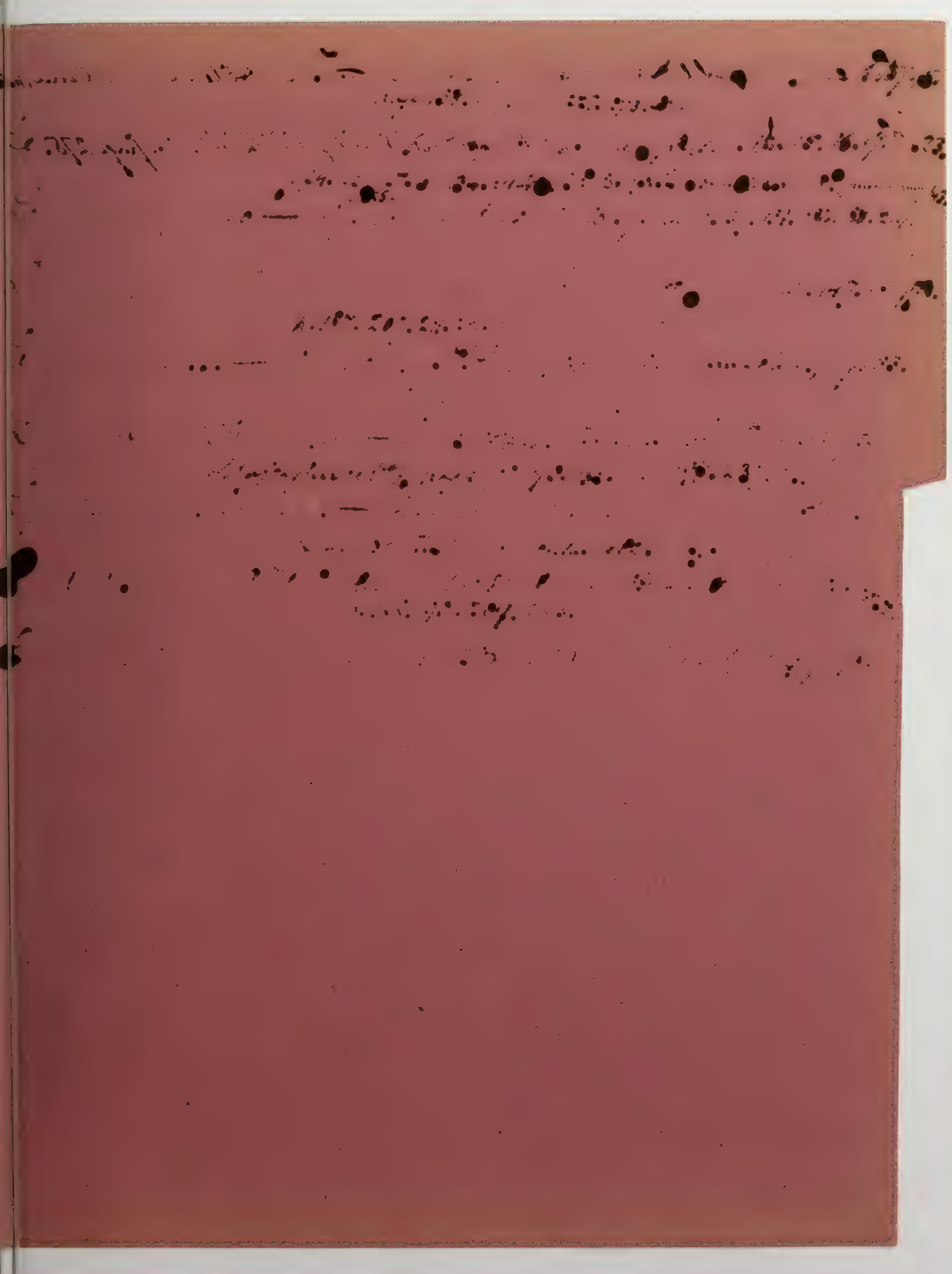

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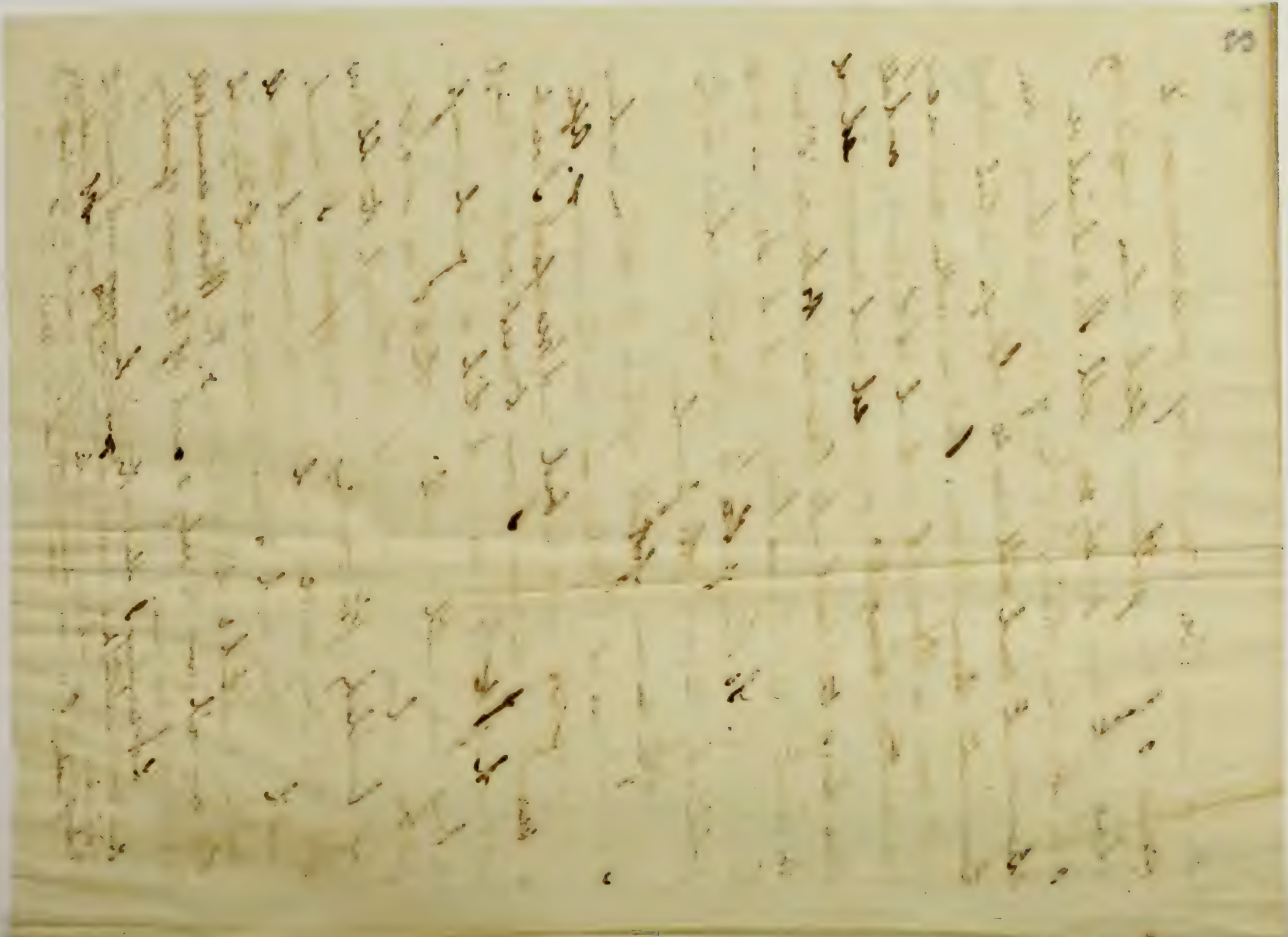
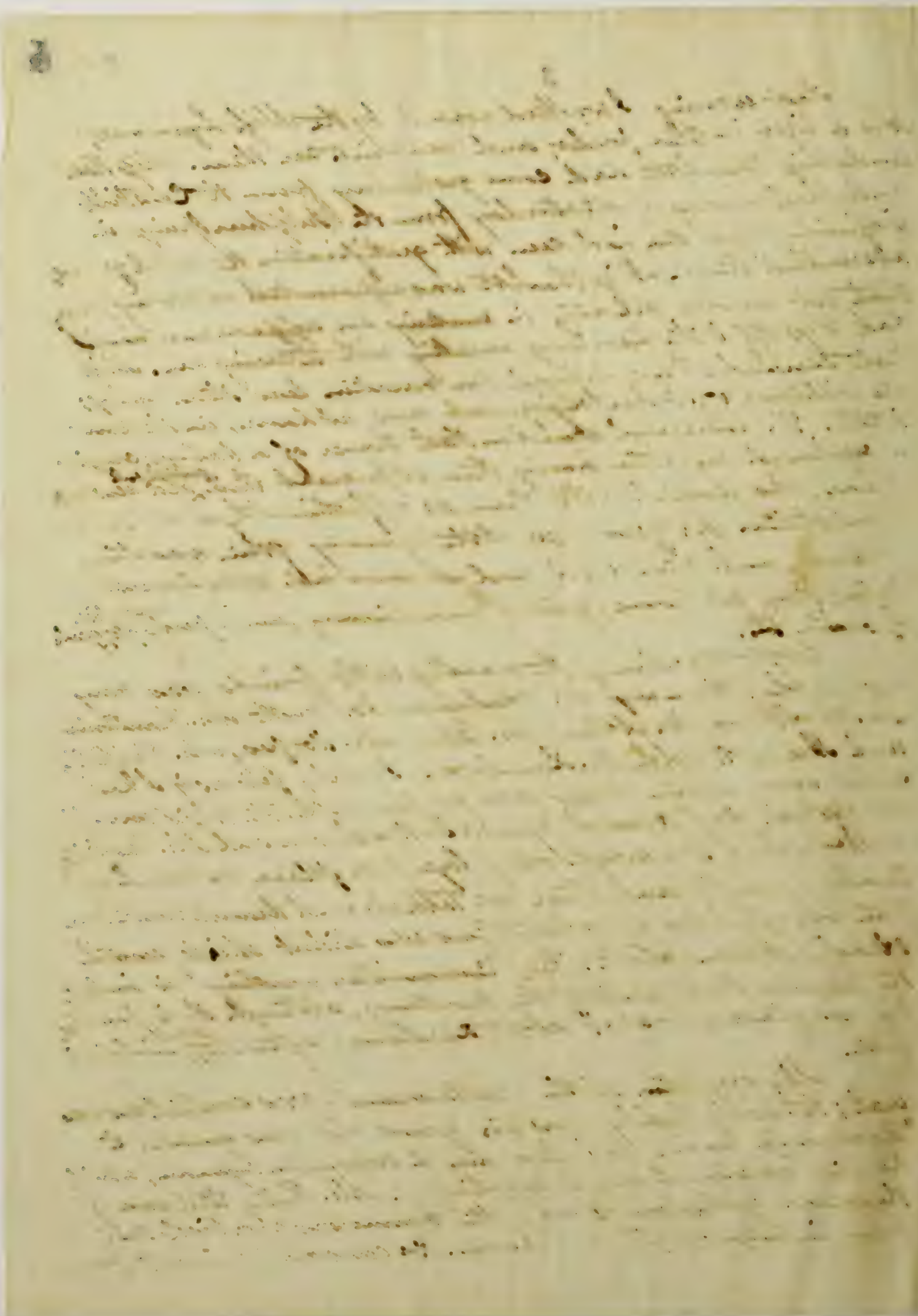




St Louis [illegible] 1853

R. H. Wilson Esq.

Dear Richard:

135 South Fifth Street, Philadelphia, 38[illegible]

Lea [illegible]

My dear Sir:

I return you herewith your pamphlet of [illegible] Notes on South Devon and Cornwall, which [illegible] kindly handed me to read; and I am much [illegible] for it. Nisbray interesting and your marginal [illegible] add [illegible] to its interest.

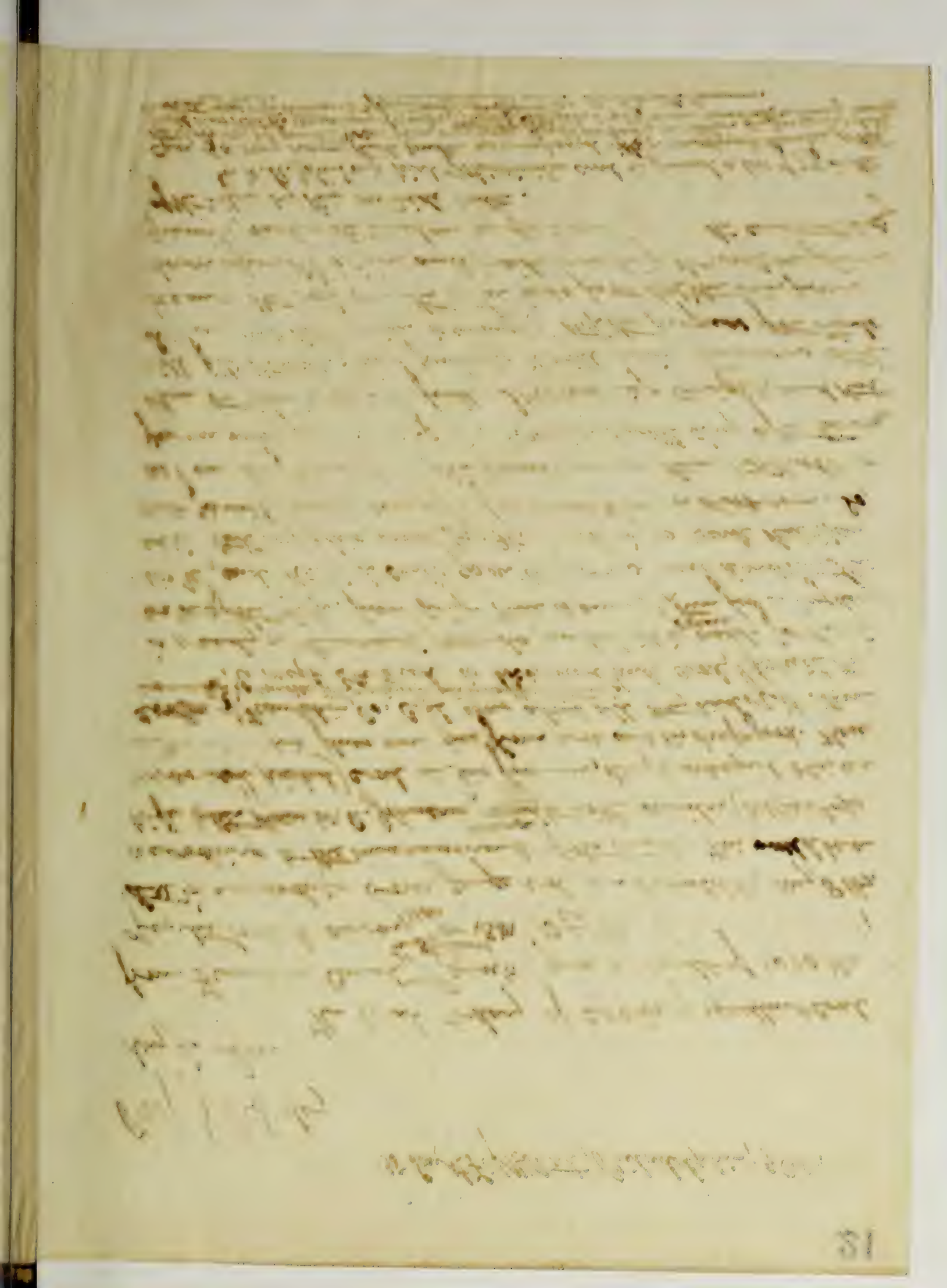
I [illegible] you [illegible] safely and found your wife in better health than you feared.

I [illegible] me early Thursday morning. I saw [illegible] James at the library yesterday, and he appeared to be very well after his summer vacation.

Hoping to have the pleasure of seeing you here in Philadelphia before very long, certainly before the next academy meeting at [illegible], and then at any rate, I remain, as ever,

Very affectionately yours,

Benj. Smith Lyman.



135 miles 17th Street Cincinnati Ohio 11 Sept 63

Mr. J. Fowler.

Sir:

The trial today resulted in boiling away 1455 lbs. of water with 182 lbs. of coal or the amount from dean evaporating 8 lbs. of water with 1 lb. of coal; all done with Reil's evaporator with the same tubes and fire as used in the regular test tomorrow and will be continued in daily by that time by means of the Fowler Test plate and the evaporator is removed this Reil can be tested with the same coal, same fire, same feed water, same draft and same engineer, with interchanging of the evaporators.

I have given the idea of the Fowler Test plate, and make some slight alterations in the plate, which would be necessary, and I am ready to demonstrate of such efficiency. I however, as they do not employ me directly. I have had some correspondence, when I came to Cincinnati with Mr. Reil and have known him for some time, I would be glad if I was an Engineer and have had some conversation with Mr. Reil, that will have a very high opinion of his ability as an engineer. Should you desire any information in regard to Mr. Reil you can address me at this place.

Yours.

Assistant Engineer.

135 South Fifth Street, Philadelphia; 14 Sept. 1865.

James Forrest Esq.
Sec^y of the Institution of Civil Engineers,
Great George Street, Westminster.

Dear Sir:

Your esteemed favor of the twentyeighth of last month is at hand, and it gives me pleasure to send you in return four numbers of the American Journal of Mining, namely those of the 15th of July, the 1st, 8th and 15th of August, which contain the whole [illegible] of the Paris and Freiberg Mining Schools. There is no [illegible]

Beyond this, I have little to say that would probably be new to you in answer to the inquiries of your circular. The general system of engineering education (except Military Engineering) is in America carried on in so called "Scientific Schools" and "Polytechnic Schools" or "Institutes", it is by without government support. The courses of study and [illegible] of these schools are not well known to me, but you can [illegible] by their yearly catalogues or circulars [illegible] to all applicants. These schools give diplomas [illegible] pass their examinations, but our laws do not require any such diploma before a man may practise as an engineer. Some of the principal engineering schools that occur to me are: the Rensselaer Polytechnic Institute of Troy, New York; the Lawrence Scientific School, and the School of Mining and Practical Geology, with [illegible] Cambridge, Massachusetts; the Sheffield Scientific School of Yale University, New Haven, Connecticut; the Columbia School of Mines, New York City; the Technological Institute, Boston, Massachusetts. At most of these schools or at all of them, other students besides engineering students are taught. Many engineers have never studied at these schools but have gained their knowledge by serving with a practising engineer, and this was especially true in former years. I know nothing of the fees in such cases; but imagine there are none in general, but that the learner is paid for his services in proportion to their value, little or nothing at first and more afterwards. Any body in this country is as free to assume the style and title of civil or mining engineer as he is to take that of blacksmith, and [illegible] any regard to school diplomas. Prof. S. Edwards Warren of the Troy Rensselaer [illegible]

135 South Eight Street, Philadelphia, [illegible]

[illegible]

[illegible] smoothly by means of putting some fire-brick upon it, so that [illegible] flame. The coal burnt in the [illegible] was [illegible] yesterday from [illegible] 353 lbs. [illegible] boiled away 3.75 lbs. [illegible]

[illegible] one of coal, about half a [illegible] without [illegible] the smoke burning [illegible] anything, the through [illegible] more than a little [illegible]

[illegible] the [illegible] is the best Penn Coal again.

[illegible] came from [illegible]. He [illegible] to you some [illegible] ago [illegible] and hopes you will pass through [illegible] as you come this way.

[illegible] this evening to ask me to take tea [illegible] this evening with you brother Henry [illegible] could not get in early enough [illegible] all at his house were well. [illegible] this evening after the Academy meeting that he [illegible] and others [illegible] on the Philadelphia and Erie and Penna Rail Road [illegible] tomorrow and come back Sunday; so [illegible] I suppose, the rest of the week.

[illegible] all.

Ever affectionately yours,

Benj. Smith Lyman.

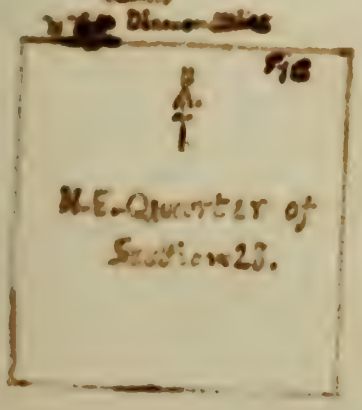
[illegible] Jefferson, Philadelphia, [illegible]

[illegible] Brandley. Boston.

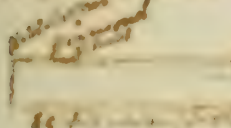
May dear sir,

[illegible] journey of the Railroad [illegible]
evening.

[illegible] Shaw is [illegible] Canada [illegible]
and the [illegible] is upon the Coal [illegible]
in the [illegible], which we have seen [illegible]
Stockbridge days. Perhaps we came in [illegible]
The map which Shaw is preparing [illegible]
to have [illegible] and additional information [illegible]
[illegible] which is an organized [illegible]
would not [illegible] be in
[illegible] in Norwalk [illegible] and on [illegible]
[illegible] would be willing, I presume, to [illegible]
[illegible] and [illegible] the main
[illegible] Railroad [illegible] and it is hardly possible to [illegible]



[illegible] position of [illegible]
State boundaries, just [illegible]
the Northeast corner of [illegible]
[illegible] and [illegible]
[illegible] your Northeastern corner and [illegible]
[illegible] Canaan Township is [illegible]
Coal Cliff [illegible] the [illegible]
This abandoned [illegible]
[illegible] be in the Coal Vein called [illegible]
[illegible] and [illegible]



135 South Fifth Street, Philadelphia, 16 Sept. 186[illegible]

Prof. J. P. Lesley,

My dear Sir:

350 pounds of Penn Coal today boiled away 3350 pounds of [illegible] according to our gauge rods in seven hours; or 9 4/7 pounds of water [illegible] of coal. This is four thirds of a pound less than the [illegible] with [illegible] Coal the other day of closely similar quality. The assistant of Mr. Rich thinks the poor success today is due to soot in the flues of the boiler, and he is going to clean them out and try [illegible] coal again tomorrow. The flues [illegible] with them in fixing up, and they have not been cleaned [illegible] apparently since the beginning of the [illegible] at least. Mr. Rich was not by at the trial today.

I am very glad to hear through Aunt Susan today that any [illegible] will be acceptable to you on meeting nights at [illegible] at all times.

[illegible] has heard through P. E. Chase, who got it from Jo. [illegible] professor [illegible] offered you and he chokes in his [illegible] a little about the catalogue; but I reassured him [illegible].

Ever affectionately yours,

Benj. Smith Lyman.

1335 Locust St. Philadelphia, Oct. 16th

Mrs. S. J. Darling.

My dear friend:

I was very welcome [illegible] & cordially & cordially & cordially received and entertained one week.

Since [illegible] Mr. Darling and I have been [illegible] the [illegible] but [illegible] [illegible] [illegible]

135 Steed St. Phila. 17 Feb.
1875.

Prof. J. Peabody.

My dear Sir:

[illegible] rounds of the Beam Creek today [illegible] scarcely 35 1/2
[illegible] in [illegible] rounds, or a little over [illegible] rounds
[illegible] 35 [illegible] and about five per cent: better than yesterday's
[illegible] Mr. [illegible] himself was present and a minute
[illegible] today, as [illegible] yesterday. Record the improvement
[illegible] his clearing [illegible] flues this morning and removing
[illegible] impossible from them. But the morphine [illegible]
[illegible] fire in the bathhouse stove heat, for
[illegible] the [illegible] correspondence with Edinburgh who
[illegible] for [illegible] quarter hour and attend
[illegible] [illegible] [illegible] three seconds of [illegible]
[illegible] [illegible] yesterday. He [illegible] would fall off very
[illegible] [illegible] during [illegible] for it often [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] and [illegible]
[illegible] [illegible] [illegible] [illegible] Creek, while the Pa
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] better than
[illegible] [illegible] although [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] made a discovery today, which I may [illegible]
[illegible] [illegible], and which consisted in [illegible] I had done days
[illegible] and again yesterday. The [illegible] of the donkey, hemp [illegible]
[illegible] [illegible], also for [illegible] well and [illegible] [illegible] of the trouble
[illegible] [illegible] [illegible] [illegible] when the boiler was fed by the injector the valve in the
[illegible] [illegible] would [illegible] one of these [illegible] closed, all that was
[illegible] [illegible] [illegible], but was that the pump feeds the boiler this valve is often
[illegible] closed. Now, this morning after beginning [illegible] trial both
of these valves were shut for about ten minutes [illegible] in the tank
did not fall in the least [illegible] formerly, when the injector was in use, the water in
the tank had a [illegible] it was called, which could only be explained by
some reading of the [illegible] the tank and hardly by that; and this [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
the impurities that [illegible] [illegible] [illegible] [illegible] gave an average of the first
four hours 35 pounds higher than the corresponding hours today; and the continued
[illegible] in the same four hours the day before that amounted 116 [illegible] more than those four hours
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

135 South Fifth Street Philadelphia Sept. 1

James M. Barnard Esq.

My dear Sir:

I have had a chance to work a little to-day on the [illegible] coal bed, and hasten to correct a false impression given by my letter to you of the fifteenth. I see by the map in its present condition that the upper of the two coal beds, that is, No. 1C, [illegible] old drift near the northeast corner of the tract, underlies a [illegible] portion of the tract than I was thinking. The ground lies so low in [illegible] that this bed rising westward crops out soon, so that [illegible] more than about half the tract [illegible] be underlain by [illegible] considering that there is an unknown, but probably considerable thickness of loose drift upon the land, the coal [illegible] before reaching the surface of the ground, [illegible] does not therefore [illegible] underlie more than say, a quarter of the tract. The [illegible] bed, No. 1B, however no doubt underlies the whole [illegible] is the only bed you were [illegible]. Its greatest depth [illegible] water is about seventy feet, it seems. I am more than ever [illegible] that there are the two beds opened near the northern [illegible] and that the one at the old drift near the northeast corner [illegible] the coal No. 1C, and not the same [illegible] near the northwest [illegible] at the Diamond Mines; and that the dip is easterly [illegible] the [illegible], instead of making a basin through the middle of it.

The map and report will probably be finished now very soon. Hoping that the delay is putting you to no inconvenience, I am,

My dear Sir,

Very truly yours.

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia, 19 Sept. 1808.

[illegible]

[illegible]:

The newspaper with your letter in [illegible] hand [illegible] and was very acceptable indeed; the letter was very [illegible]. It is a pity that [illegible] [illegible] of it was to be to no purpose, as it proved.

I saw a letter yesterday from Mr. Lesley dated the fifth [illegible] that Mr. Lesley would not probably be here [illegible] of next week. We [illegible] [illegible] get to these parts, and I do not think he will [illegible] [illegible] on his voyage.

Very truly yours,

Benj. Smith Lyman.

[illegible] Philadelphia, 22 Oct. [illegible]

Prof. J. P. Lesley.

My dear Sir:

Yesterday morning the experiments were to go on again, but I was rather surprised that no message arrived before I started from home that there was no coal yet and that the work must be delayed. So I set out, but at Diamond Street, where we change horse cars, Mr. Rich's assistant met me [illegible] enough, to say that he had arrived at my office just [illegible] and that he was sorry to disappoint me, that [illegible] no coal yet. This morning again I set out [illegible] the car just as I arrived at Rising Sun, [illegible] to disappoint me again, coal not yet [illegible]. [illegible] the [illegible] is to go on — if he [illegible] me [illegible] before I leave home, to the contrary. I bear these "disappointments" with resignation that must seem [illegible] to him [illegible] Mr. Rich.

As to Reading this evening Mr. Frazer was present. He said he had been at home a fortnight. He feels much better, but is [illegible] yet [illegible] may [illegible] leaves [illegible]. He and Dr. [illegible] both inquired when you would be here. Our lager bear "section" of Mr. Frantwine is dubbed the presidents met as usual after the general meeting, and though smaller in number than usual, as the night's raining, had an agreeable meeting and broke up about eleven.

Give my love to Aunt Susan and the children, and believe me ever

Affectionately yours.

Benj. Smith Lyman.

[illegible]

[illegible]

[illegible]

[illegible] of yesterday is this evening at hand.
[illegible] here next Wednesday or Thursday and
[illegible] matter before [illegible].
[illegible] will be soon enough to suit your
[illegible] Lehmann, as ever,

Yours very truly,

Benj. Smith Lyman.

[illegible]

135 S. 12th St. Phila. Pa. Feb. 6th 1878

Dear Sir,

Mr. Cramer Coal was tried today, and 16 pounds and 1630 pounds of steam in 5½ hours; or 10.6 pounds of steam per coal, and 478/11 lbs. of steam an hour.

The sample of Broad Top coal is to be tried, and then my supply. Both this and the Cumberland are used [illegible] ... [illegible] ... [illegible] ...

[illegible]

I say again that it will give me great pleasure to serve you as far as I can, and if you should come this way to see you and talk over [illegible] how you would [illegible] [illegible] pers.

135 Pine Street, Philadelphia.
28th Sept. 1[illegible].

[illegible]

I have received today of two or three friends and [illegible] Mr. Rhoads [illegible] Mr. Rhoads [illegible] Mr. Rhoads

for a good Woman [illegible]. Perhaps you might like to [illegible] and prove satisfactory, if you [illegible] it in case [illegible] me.

I would probably be [illegible] for you, if you [illegible] Receipts to remit to [illegible] you [illegible] Bank Notes of Pittsburgh and [illegible] through Phila. [illegible] in your own name and [illegible] Remit you could also [illegible] Bills if you thought fit, and could [illegible] Writing. You could probably get Letters from [illegible] to this one that would be [illegible] you at Rochester and perhaps at Lewiston, Niagara Falls, Utica; and at these places and [illegible] your way [illegible] at Pittsburg and [illegible] Harrisburg, Philadelphia, Reading, [illegible] New York, at [illegible] miles from this City and Delaware and could perhaps introduce you [illegible] as Teacher [illegible] Young Men [illegible] Superintendence of [illegible] Institute. After the Term [illegible] If you thought [illegible] [illegible] you might [illegible] on your way [illegible] Lewiston, Utica, Rochester, Albany, Troy, [illegible] Boston. If you [illegible] Rochester, Albany, Troy, [illegible] Boston, [illegible] Rochester, Albany, Troy, [illegible] Boston, [illegible] Rochester, Albany, Troy, [illegible] Boston,

Ashley 18 Sept 1854.

My Dear Mrs Higgs.

[illegible] I am very glad to hear from you [illegible] I am sorry to hear that you have been so unwell, and I hope that you will soon be quite well again. I am very glad that you have been able to get [illegible] I am sure that you will be very happy there. I am very glad that you have been able to get [illegible] I am sure that you will be very happy there.

[illegible]

[illegible] Philadelphia, [illegible]

[illegible]

Dear Sir,

[illegible] of the month's duty of paying [illegible] for me to be upon [illegible] that many of us [illegible] paying the [illegible]. I would make [illegible] as far as to say as [illegible] three dollars and the necessary [illegible] [illegible], [illegible] [illegible] and [illegible] [illegible] [illegible]

[illegible] 8th Fifth Month, Philadelphia, 8 mo. 68.

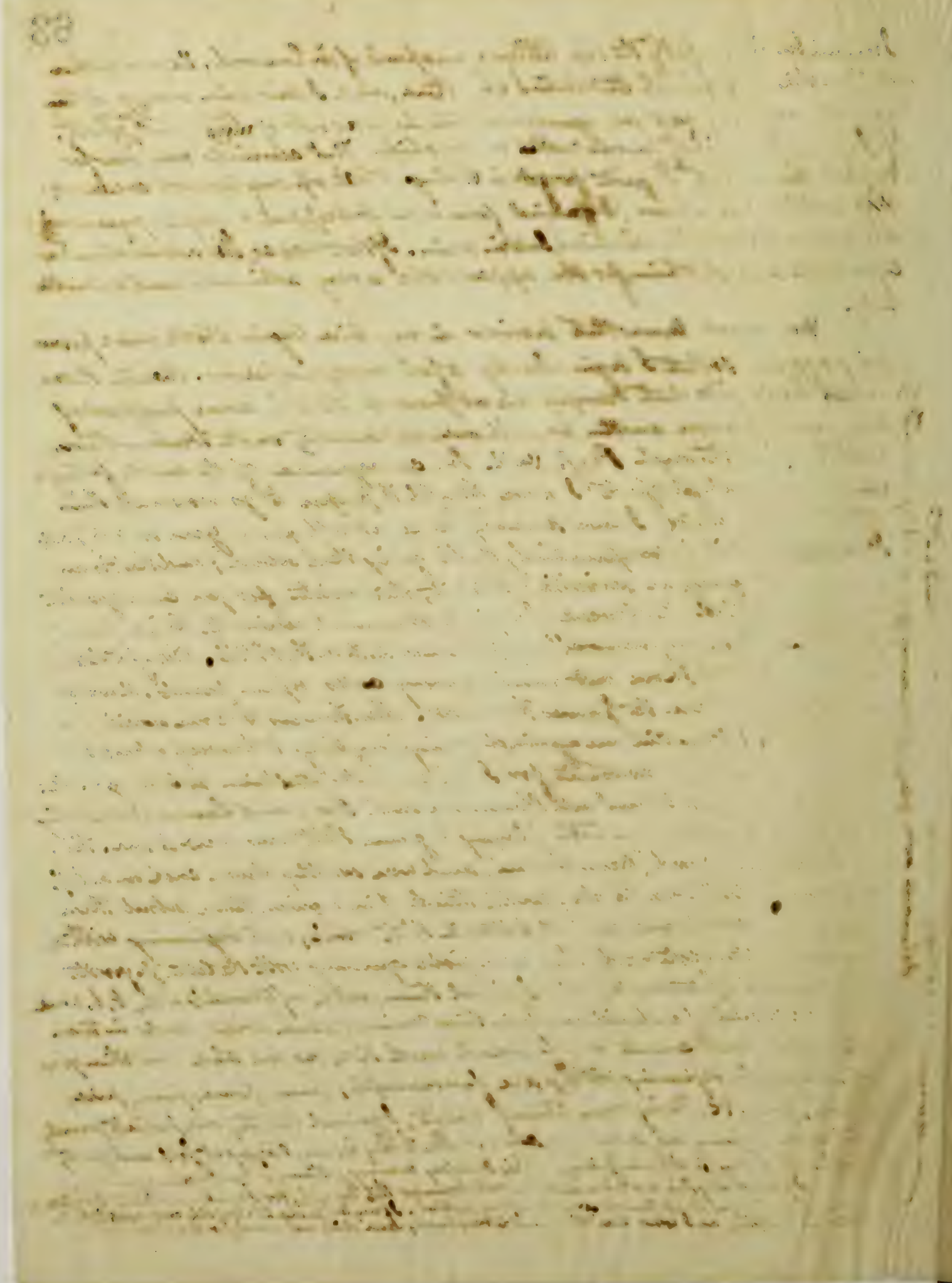
Dear Mary,

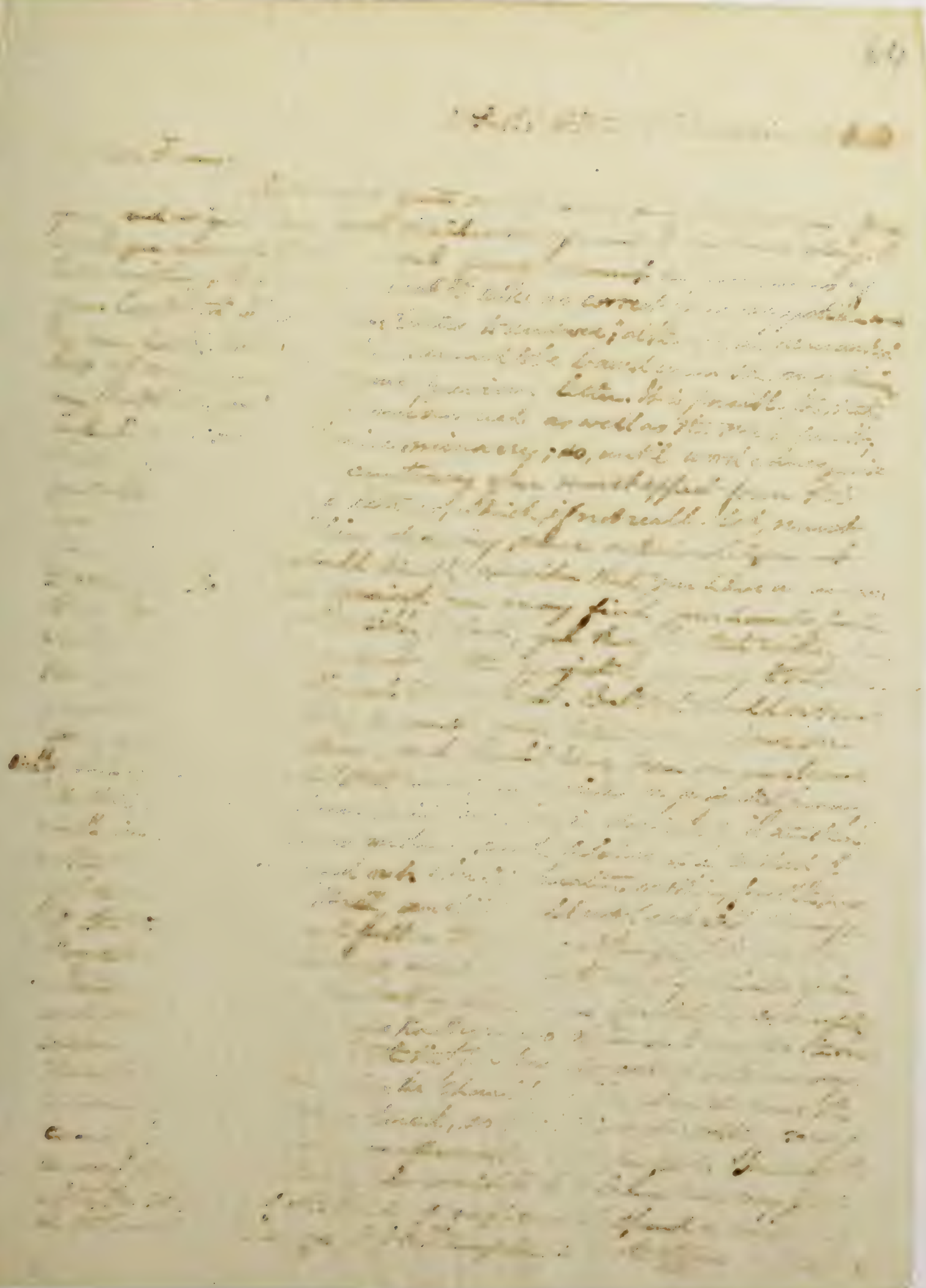
[illegible] of last November came duly to hand. Since then I have [illegible] and have [illegible] to spend the greater part of the winter in the [illegible] and [illegible] [illegible] [illegible]

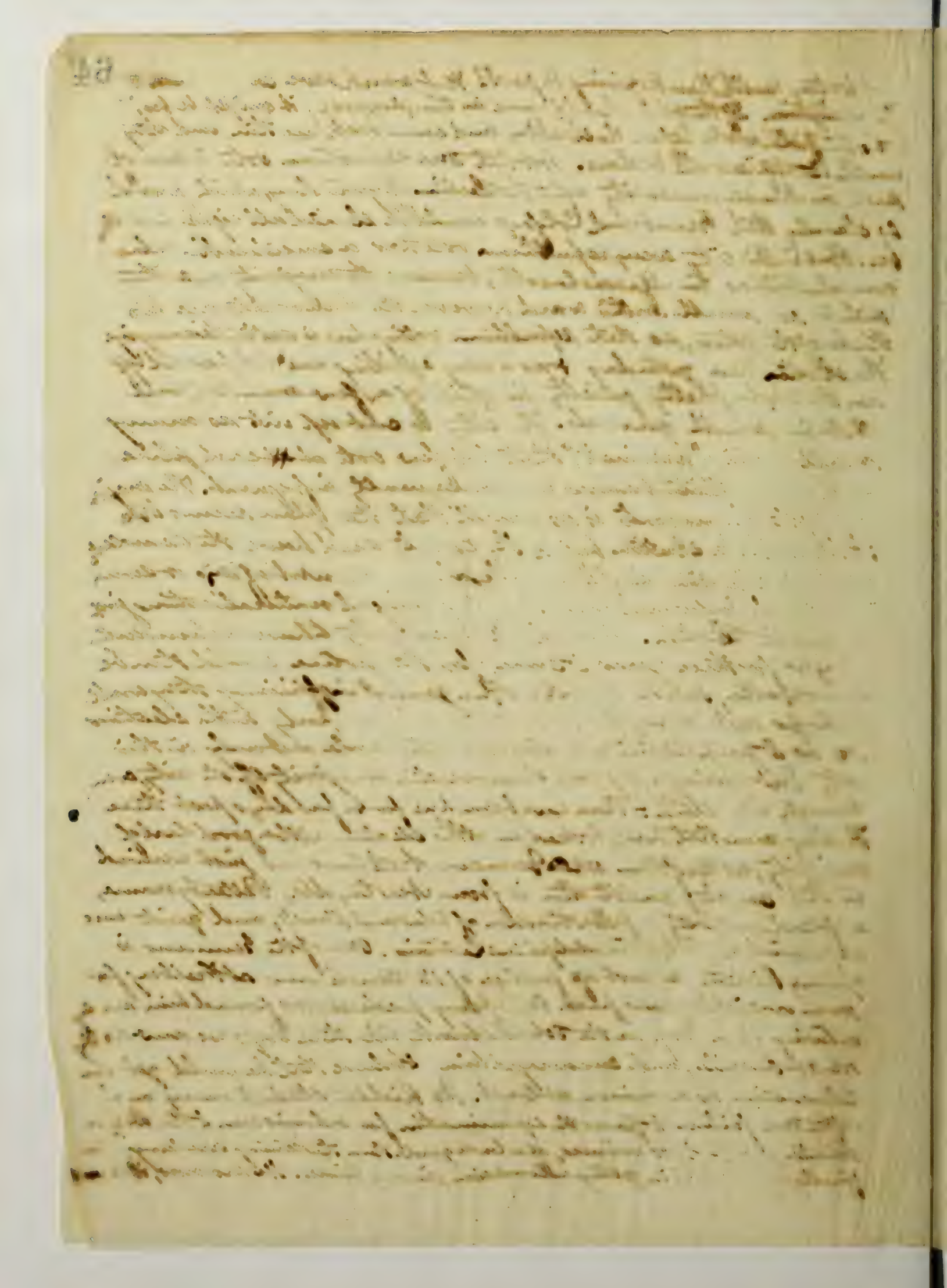
Mr. Lesley arrived in Boston from Cambridge Saturday, and went right out to Jamaica Plain. He has been in Boston every day since and dined with us on Tuesday night, the night of the meeting of the Historical Society. He seems pretty well, but has not much use of his right hand. He dined at Mr. Everett's on Monday and Tuesday. Does not sleep well. Mr. Lesley, of course, has declined the professorship of Botany at Harvard. He prefers that of Natural History at Brazil. He is not pleased by Mr. Agassiz's influence. The Professorship is not a very lucrative one, however, the salary is only $1800 and nothing else. Mr. Lesley also declined to preside over the Girls' High School, for he wishes to be perfectly free from any and all engagement this winter, that he may attend to the completion of his Catalogue of the Library, and avail himself of the opportunities which are peculiarly favorable for bringing this work to a close. Mrs. Lesley is not well. She has been ill with a cold ever since she left Cambridge.

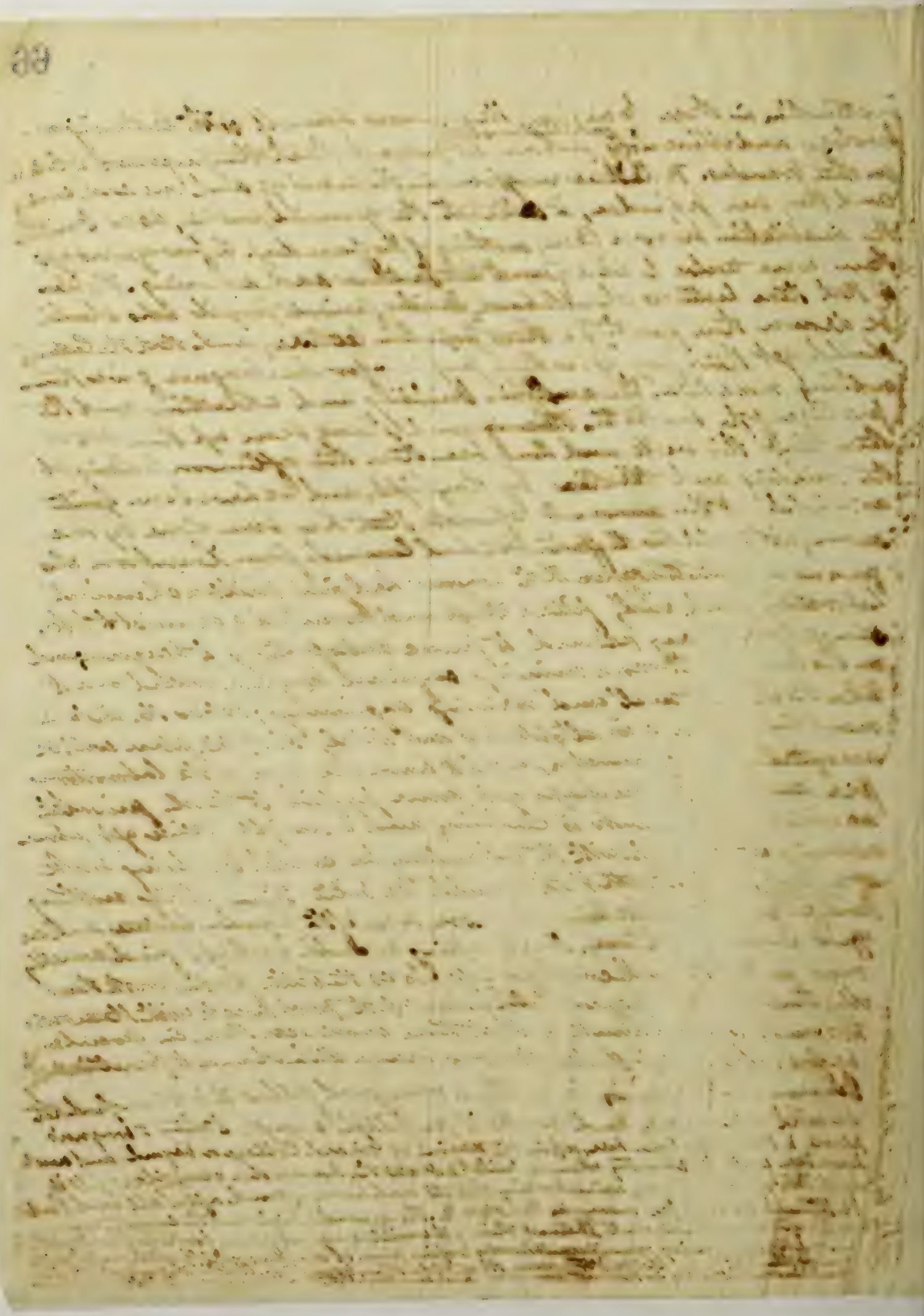
The Social Science Convention has been in session Wednesday and Thursday and Friday. The exercises on Wednesday afternoon in the hall of the meeting of the Historical Society, and also in the evening, and also in the Music Hall, were very well attended. Public meetings were held in the streets on Thursday evening, and also in the evening. The meeting on Thursday evening was the largest crowd ever seen in Boston. It was held in the Music Hall. The Boston Symphony Orchestra was present.

I went last Wednesday to see St. Paul's and for the first time I visited the Tombs. They are a sad sight. The Hall of Justice is a very fine building. It was built about three years ago. It was all new to me and very interesting. And in one of the courts we visited, it was at the trial of Hunter, who, [illegible] was acquitted by the jury. [illegible] a little [illegible] problem. [illegible] in [illegible] and [illegible] [illegible] [illegible]









chamber

draft on the Illinois State Bank

by [illegible]

above.

the cashier of the [illegible] above described.

[illegible]

and to [illegible] demand already for domestic use and for [illegible] poses, and is hauled in wagons for miles through the neighboring country; and [illegible] land is extremely much more valuable than the best farming land. It is clear that the demand for coal must greatly increase as the country becomes more thickly settled.

The [illegible] is only two miles and a half south of the Chicago, Rock Island and Pacific Rail Road, at a point three miles east of Oakley and six miles west of [illegible] and only [illegible] miles south of [illegible]; with a very direct wagon road to both. Oakley is only fourteen miles east of Rock Island by the rail road, and sixteen from [illegible], places that [illegible] for coal; to say nothing of the [illegible] ment from them up or down the Mississippi.

[illegible]

Philadelphia, 15 [illegible] 1866.

35 South Fifth Street, Philadelphia, 19 Oct. 1868.

[illegible]

Your favor of the fifteenth came duly to hand. I [illegible] were so well pleased with the result of the [illegible] as a whole. Our city election was not wholly [illegible] much better than last year's. The republicans [illegible] but were defeated in other offices, mostly [illegible] majorities, and [illegible] mayoralty by the [illegible] of all, about 1800. This will be bad for [illegible], for the police will be democratic and [illegible] gross frauds of the democrats perhaps, if they [illegible] [illegible]. But there is a strong disposition [illegible] and prove that a large number of votes, from 5000 to 7000, were fraudulent, as coming from [illegible] and from New Yorkers and Baltimoreans. The republican candidate for mayor, however, does not seem to care much for the office for his own [illegible] perhaps not disposed to contest the election. He is first cousin of my classmate Mitchell, and a good fellow. I do not know Mr. Hunt Butler's politics, but his son [illegible] a good republican, though I have [illegible] his politics now for some months. The account of [illegible] Dewey's wedding is quite interesting. I have never [illegible] of the lawyer here named Aldrich who acted as groomsman.

My time lately has been a good deal taken up with two or three Freiberg Students that have just come here from there. Two of them are Germans, and one of them has already found work to do with my friend Tobey Coxe, and after spending a week or two days here has gone up the Lehigh & Coxe's coal mines. This German could not yet talk English. He was an old acquaintance of mine in Freiberg; but then he was just beginning his studies and was still earning his living by working at the mines. The other German is older and better educated; and he is in search of a situation as chemist or metallurgist, but is not so pressed for money but that he can wait a few months if necessary. His a very intelligent good fellow, and talks English pretty well already, and I have a domestic pleasure in his society. The other Freiberg Student is an American named Pettigrew, Newton near Boston, and lately a fellow traveler of Edward Howe's. He is now gone after being here a week. The German chemist is still here, but will go away for a short time at least, day after tomorrow. His name is Koenig. The one who went up to Coxe's is named Richter. Richter which here took the first step towards naturalizing himself by declaring his intention to renounce his allegiance to all foreign powers. All three were much interested in seeing our election last Tuesday. I tried to set the foreigners straight in politics, but I fear they thought me too much of a partisan to be trusted implicitly, for they did not seem in a hurry to adopt any settled political opinion.

Give my love to all Your affectionate Son. Benjamin Lyman.

[illegible] Fifth Street, Philadelphia; 20 Oct. 1888

Jas. M. Bannadley.
Hotel [illegible] Boston.

My Dear Sir:

Your esteemed favors of the seventeenth of last month and of the eighteenth of this have both come duly to hand.

I have found worn for more work upon the map than I expected [illegible] and upon it when at Northampton, and, owing to your indulgence in regard to time, have worked it up carefully; but in spite of many interruptions and delays it and and the [illegible] are at length done. The map has been photographed on [illegible] of the [illegible] original and a copy of the photograph attached to the report. Should you wish for more copies of the photograph the photographer [illegible] is willing to furnish them at seventeen cents a piece. The original map has been framed; and the map, the report, the printed County map, and the letter of [illegible] you lent me have today all been sent to you in [illegible] by express (Adams, express paid through). There has been a delay of several days in getting the map photographed on account of bad weather. I hope it will all arrive safely, with unbroken [illegible], and prove in all respects satisfactory.

You inquire in the letter received today about the manner of estimating the amount of coal in a piece of ground. After calculating the map the number of acres underlain by a [illegible] bed, I reckon a ton of coal (soft coal) to each cubic yard contained in the bed; or a million tons to a square mile of a bed a foot thick. A bed two feet and a half thick would contain [illegible] therefore two millions and a half to a square mile, or 625,000 tons to a square square mile. This is about the whole amount as the coal lies in the bed; but of course a certain amount is lost in mining.

I remain, my dear Sir, very truly yours,
Benj. Smith Lyman.

[illegible] Philadelphia, [illegible]

Jas. M. Barnard

Hotel Pelham Boston.

My Dear Sir:

For acknowledging the receipt of the report and map sent yesterday, pray be so kind as to say whether you have still any objection to my making [illegible] the result of the examination of your land. As I was inclined [illegible] as favorable you will very likely have [illegible] objection; and I should be glad to send photograph [illegible] of the map to a few of my friends as a [illegible]

Very truly yours.

Benj. Smith Lyman.

1305 South Fifth Street Philadelphia, Dec. 15.

My dear Sanborn:

Not is indeed a good wish that you and your
[illegible] I work as the world bids. Between ourselves
[illegible] I see it refers to
[illegible] and Ito at last accounts, very glad
[illegible] I hope
[illegible] "Some folks
will like us!" You are probably aware of the
[illegible] I have
[illegible] I have Stanford had the Engineering
[illegible] I have an Italian; and I have in that way kept myself
[illegible] I have
[illegible] I have
[illegible] I have

I could not help mentioning him. Mr Parkman Blake has been ...
He sent me his card & left ... with his house number on it and ...
I shall ... I ... and I had to keep ... about ...
... Cards. Tell ...
Cope ... card in it ... with ...
... If ... I ...
... I ... I ...
... I ... I ...
... I

35 Southwark Street, Philadelphia, 2 Oct. 1833.

Charles Mac Donald
Civil Engineer
Reading Pa.

Dear Sir:

My friend Mr. Franklin said last evening you would to hear from me on what terms I would take a general examination of some land near Toronto supposed to contain possibly gold. It is hard to fix upon the fee to charge without knowing anything of the size of the tract nor its precise position and accessibility but if it contains less than five hundred acres, I will undertake the examination for two hundred and fifty dollars and the expenses of the trip, of which one hundred and fifty dollars to be paid in advance and the rest on handing over the report. If the tract be larger than that, the fee would be somewhat more. As the season is already getting a little advanced for Canadian work, it would be desirable to set out before long. Hoping that the terms may prove satisfactory, I am

Very respectfully yours,

Benj. Smith Lyman.

[illegible] Philadelphia [illegible]

J. W. Harden Esq. Wilkesbarre.

My dear Sir:

Your favor of about three weeks ago came duly to hand but was not answered immediately because Mr. Leeley was expected here so very soon that it seemed not to wait for [illegible] coming before writing. When we came your letters were [illegible] to him, and he arranged an appointment with your lawyer as much as a fortnight or more ago, and the lawyer did not keep the appointment and nothing has since been heard of him by Mr. Leeley. Your letters have been mislaid by Mr. Leeley and the name of the lawyer not well remembered; but thinking it was Mr. [illegible] of No. 4[illegible] Walnut Street, I went round to his office today to see about the matter again and found a card [illegible] saying he was in New York and not to be here [illegible] Saturday. After that I will try again to see him, for Mr. Leeley says he will be happy to do his part in the matter. Mr. Leeley is staying at his brother Joseph's ten miles out of town, but comes in often; and other affairs [illegible] this from my head at the time when I could [illegible] it.

Hoping that this delay has put you to no trouble I am, as ever,

Very truly yours,
Benj. Smith Lyman.

[illegible] Philadelphia, [illegible]

Dear Sir:

[illegible] Mr. Koenig [illegible] you [illegible] especially to thank you for [illegible] very great [illegible] [illegible] in the morning and had a [illegible] [illegible] coming in here together, but Mr. [illegible] [illegible] Mr. Koenig. Mr. Corbin is glad [illegible] [illegible] early [illegible] morning, and in my [illegible] [illegible] [illegible] of his name on it. I should not have [illegible] [illegible] [illegible] him in your letter [illegible]; but his face was familiar [illegible] [illegible] [illegible] Mr. Corbin certainly deserves great credit for the [illegible] [illegible] [illegible]

him. Just as we met Cope, Dr. Koenig came in to deliver himself
[illegible] introduction, and was agreeably surprised in finding
Richter there, for he had feared he was quite lost. Richter had indeed
been taken by the hackman on his arrival to a miserable little Germany
hotel on Spruce Street between Front and Second; but both he and
Koenig went to a hotel on Third Street above Callowhill, Pennsylvania
Dutch place that was a little better. Richter [illegible] here
ten days and went up the same day with Cope to the mines.
Before going Richter took the first step towards getting naturalized,
making his declaration of intention to renounce his allegiance
to all foreign powers especially the King of Hanover. Koenig has re-
moved to a boarding house and is still here. Two or three
openings offer for him, all of them quite small or else very
uncertain; but he may find something to keep him alive
here through the winter. Indeed he has means enough with him
to last six months or more, if necessary he says; but he hopes
to find something profitable to do even before business revives
in the spring as many expect it to. He seems to feel ready
to go [illegible] the far west, as he has a curiosity to see the geol-
ogy of [illegible] regions. He and Richter had been here but a
day [illegible] when Pettee, your late president, walked
in [illegible] to Richter's astonishment. Pettee stayed here a
week [illegible] our October election, and then went up
the Lehigh to see Iron Works there and over on the North
Branch of Susquehanna at [illegible], and was then
going to Harrisburg to see Pearse who is chemist at the
Pennsylvania Steel Company's works there. Pettee travelled
with Edward Howe in England and came with him to America
last July or August. Howe became engaged to be married al-
most immediately on his arrival; the lady is Miss Lizzie Cushing
of Boston. — I have heard nothing of Bauer, whom you mention.
I am glad to see your father in such good spirits and working
so well.
Very truly yours. Benj. Smith Lyman.

135 South 8th Street, Philadelphia, 24 Oct. 1868.

Mr. Franklin Platt Jr.

No. 2227 Spruce Street.

My dear Sir:

Here is the best plan I have been able to think of for the geological studies you proposed making with me.

As you will no doubt become familiar with the practical details of geological work, it seems desirable, in spite of the practice you may have already had in both the field and office work of surveying, that you should do a certain amount of the ordinary office work as well as geological field work and topographical surveying as my assistant. Much of it may seem mere drudgery, but even drudgery has its use if it is not carried too far. It is also very desirable that you should have time for the study of books and some guidance and help in that study. Recitations or oral questioning is no doubt useful even to grown up students as an incentive to study; but it would be most likely irksome to both of us, and another plan seems to me still better. I propose giving you, say once a week, a subject to read up in books that I may indicate, in order afterwards to write a paper upon it, in which paper you shall state briefly and as clearly as you can the main points of what you have learned. This will lead you to digest more or less successfully the information you get, and the hours of mechanical drudgery will be of use for this very purpose of digestion. Besides guiding your readings in this way I may be able to give you, in a conversational way as we work in the same room, my own views of the best way of arranging the facts you learn into a system. The geological subjects given out in this way weekly for your study would be intended to cover in the course of the winter the whole ground of geology; but there would be ample room for carrying on the same plan of study much longer than that by going deeper into the details of the science. The papers you would write would be a basis for further elaboration, correction and alteration in after years.

The office work you would do would be of some value to me and would compensate me for the trouble taken in teaching

you; so that if you would do office work three hours each day, say from nine in the morning to twelve, I should feel repaid for any trouble. This arrangement would have the [illegible] that neither of us would feel tied to the other, and we could separate any day without breaking any agreement that depended on a pecuniary consideration. All this, so far, applies to office work and studies here in the city; in regard to trips into the field and work there, we could come to a special understanding in regard to each trip before setting out. I should probably expect you to pay your own expenses if you went with me and to help me in the field without compensation, in return for the practical information you would get from me there. Perhaps later I might find your services of pecuniary value beyond that. Some journeys might be too long and expensive for the benefit they would give you.

There is no field work on hand just now, but four pieces of work are tested of and it may well happen that some one of them may be ordered. One of them that has been broached only this evening is a large affair that is expected to take several months, and might occupy us in the field until the snow came and then early in the spring, and perhaps give some office work to do here in the winter. I shall probably know more of this early next week. Another of the pieces of work would also probably take some time say two or three months, but it is very distant and less desirable than the other, and it cannot be decided on for some weeks to come. If none of these surveys should be ordered I have plans of work to do that would be equally good practice perhaps for you, although it would be only indirectly of pecuniary advantage to me; and this work would be here in this city.

If the plan I have proposed for you strikes you favorably please drop me a line saying when we can meet to fix upon the time of beginning to carry it out. I shall probably be here all day Monday of the coming week, but on Tuesday and perhaps Wednesday we have to be gone during the day time into the country.

Yours, my dear Sir, Very truly yours. Benj. Smith Lyman.

[illegible] Philadelphia, [illegible]

Mr. Richard H. Allen,

Box 370, P. O., New York City.

My dear Richard:

Your [illegible] of the twenty-third has come duly to hand, [illegible] I would go to Ecuador [illegible] the [illegible] of your Ecuador Correspondent. You are quite right in supposing that [illegible] advantageously would probably require a man specially [illegible] such matters both by study and experience.

It is impossible to form a definite idea of the length of time that would be needed [illegible] without knowing anything even of the size of the [illegible] would necessarily have to be in proportion to the time [illegible]. I would undertake the work for one hundred and fifty [illegible] my whole absence from home [illegible] transportation and subsistence during the [illegible] expense for whatever labors may be needed for [illegible] the like, including [illegible]. Of this money five hundred dollars [illegible] outfit and the first travelling expenses, and one thousand dollars besides must be deposited [illegible] my draft [illegible] parties in New York. In [illegible] money I mean of course United States currency. I suppose the mere journey back and forth would take five or six weeks, and that the work there would take a month at least, as things do not move very quickly [illegible] the equator. It is possible too that your friend would like to [illegible] the coal well opened at the same time.

I should like very much to undertake the work, as I have great curiosity to see those regions, and the climate there would be an agreeable exchange for our winter weather. But on the other hand I should run many risks and put myself out of the way of other work here that would be more profitable in the long run. If the work should be undertaken, it is desirable that it should be so as soon as possible both on account of the season there and here and because I may in the meantime make other engagements here.

I send as requested two or three of my pamphlets and photographic maps for your friend; there are no [illegible] left of the others [illegible]. Ever affectionately yours, Benj. Smith Lyman.

I cannot [illegible] in advance in the [illegible] day; [illegible] the [illegible] you [illegible] as I [illegible] would [illegible] to [illegible] in [illegible] of [illegible] forty [illegible].

1035 N. 15th Street, Philadelphia, 2 Oct. 1861.

Dear Sir

Your favor of last Sunday has come duly to hand. I was glad to hear of the addition & I am sure it will be a very great improvement to the Book. I am very glad we differ in opinion as to the Frontispiece. I am sure it will always be a good seller. But will precede the History about one form. My friend & I both agree that the present picture is the most important part of the Engraving & will have her photograph in my album. I am very glad to hear of Mary, and hope Kitty & Clara; and have been expecting a letter from Mary. Mrs Larson wanted to know if Ellen & the baby.

I was at Mrs Lee's last Sunday, and got to engage for one day's walk in the Country, to take place on next Sunday week. Mary & Clara are to be there also & we shall have a pleasant time. Mary Lee is not well, & I fear she will not be able to go. She has been very poorly for some time past. I am glad to hear that Kitty is better. Tell Mary I received her letter, & will answer it soon. I am glad to hear that Mr Pettengill is better, & still more so that he will go on with his engagement at Erie, as I was very much afraid he would not.

138 South 3rd Street, Philadelphia, 28 Oct. 1836.

James A. Bell

Hotel Pelham,

Boston.

Dear Sir:

Your favor of the twenty-second last came duly to hand. I had long before [illegible] your letter [illegible] and [illegible] as soon as I could. I regret very much to learn that Mrs. Bell's health continues so delicate. I am perhaps unduly [illegible] on that subject: I recently [illegible] [illegible] [illegible]

135 South Fifth Street, Philadelphia; 28th [illegible] 1888.

Mr. Thomas Jones

Havana, Illinois.

Dear Tom:

In a letter from my sister Mary yesterday I learn with great pleasure that you and Minerva are [illegible] and [illegible] of a little daughter, and I congratulate you most heartily on this fine addition to your family. There you are at last the happy father of a family and a constant warning to us old bachelors that our case is not hopeless, that it is never too late to mend, and that patient waiters are not always losers.

Mary and Fanny have no doubt informed you fully long before this of our peregrinations after we left you; of our pleasant visit at Wills and our joing while there to the Swedes' Church [illegible] to Wills satisfaction to say nothing [illegible]; of our [illegible] attendance, the girls as well as mine in the scientific meetings at Chicago and on the evening [illegible] as well as the [illegible]; of our return home by the lakes as far as Cleveland, and how Fanny nearly lost her heart [illegible] of the passage across Lake Michigan [illegible] if her heart was in her mouth a good [illegible] and I [illegible] once talking very earnestly [illegible] to some one down in the [illegible]; how we had ten minutes at Mackinaw and looked [illegible] for your neighbor Mrs. Low, being very desirous of [illegible] whether she had found any dandies or flirts there, but [illegible] we no doubt saw her hotel, and thought it must be a dull place indeed if there were no dandies [illegible] there [illegible] they were; how we came from Cleveland to Pittsburg through a country growing hillier and hillier [illegible] could not but feel "so shut in" and pine for the wide Lakes and broad prairies; how we crossed the Allegheny and [illegible] the [illegible] without finding it blue nor seeing any wild [illegible] Alfarata; how we stood here a couple of days and then [illegible] on to [illegible] to another meeting [illegible] all this is no doubt an old story to you. But it will be long before

the girls and I will fail to find great pleasure in going over the
experiences in our mind; and you may be sure that no part
of our journey will be remembered with such pleasure as
the days we passed with our cousins in Illinois. Our visit
at Havana was thoroughly delightful and at the end of it
it was a dull company that drove away in that hack
towards Lewiston, do all we could to make the best of it.

At the end of the Chicago meeting I left the girls there
for a day and two nights (as we had through Saint [illegible]
help found quarters in a magnificent and comfortable
boarding house on Michigan Avenue), and went to look
at a little [illegible] of land near Rock Island for Mr. Jos.
M. Barnards of Boston, who had telegraphed and written to
me. Since getting home here I have made a little sketch
map of the [illegible], and I send you with this a small photo-
graphic copy [illegible] been made.

When I [illegible] Chicago from this trip I found of course
that the young [illegible] been quite attentive in my
absence and among other things had given the girls two invi-
tations to the [illegible], of which naturally they could accept but
one. You must know that one of Fanny's admirers had come
all the way from New York and another from St. Louis; and you
ought to have seen the attentions of two grass widowers among
the [illegible]. Perhaps they thought of staying out west long
enough to get a divorce, if that is really so easy a thing here
as the [illegible] say it is. I hardly know how Fanny will
have [illegible] hardly to [illegible] to [illegible]
there [illegible] a scientific meeting there too, to break the fall
as it were. Then have I not [illegible] tales enough out of school?

I think that you and Mamma and the little daughter
will continue to thrive in every way. [illegible]

Ever your affectionate Cousin

Benj. Smith Lyman.

[illegible] Dec. 1866.

[illegible]

[illegible] your letter of yesterday is to hand. I regret [illegible] you have declined [illegible] I should have been very glad [illegible] I am glad that you are going [illegible] It is a pity for us that you and [illegible] that you have probably known [illegible] and certainly what would [illegible] I am glad [illegible] I am [illegible] I [illegible] I [illegible] I

…ter and [illegible] is that the sugar coating [illegible] …
…ble advantages as a physician [illegible] …
…advantages in life attend it, [illegible] …
…with the people of different countries, with different [illegible] …
…customs from childhood, has been useful; it helps me [illegible] …
…reasonable or peculiar in many things that [illegible] …
…[illegible] …
…become much acquainted with a foreign people without …
…language [illegible] …
…abroad, learning [illegible] …
…acquainted with the people, for with these many …
…[illegible] …
…[illegible] …
…[illegible]

3

[illegible] many of your [illegible] do [illegible] honestly, that is to [illegible] you [illegible] [illegible] [illegible] enough; but I have sometimes feared that you [illegible] [illegible] [illegible] to [illegible]. But here you have the best [illegible] I can make, namely, that you may both marry and go to Europe, and [illegible]. Now that is as disinterested as you could [illegible] for what chance could I expect then for the [illegible] of [illegible] — I was quite surprised to find by this letter of yours that the grand house keeping experiment had not yet begun. I trust it will turn out satisfactory to you. I wish you would come here and keep house for the Miss Lymans (Miss [illegible] is not [illegible]); for they have plenty of spare rooms in their house and so little time for house keeping that they are [illegible] this winter the experiment of taking their [illegible] at the [illegible] house next door. They and I have [illegible] about the exaggerated importance attached [illegible] to a knowledge in young ladies of the art of house[illegible] for we think that any lady of [illegible] could learn [illegible] in a very short time when required to. This experiment of the Miss Lymans is I fear a very expensive one as [illegible] [illegible] [illegible] boarded at their fashionable place and [illegible] still to keep one servant at high wages [illegible] [illegible] enough to board herself and is wasteful [illegible] the [illegible] in their numerous fires. I have sometimes thought that I would take a lodging room at the Miss Lymans; for I [illegible] they would like the arrangement, as they often express a wish to have some man living in the house. When my business becomes so extensive as to require both my rooms [illegible] for office work, I may lodge elsewhere. But I have always felt a little doubtful as to how these ladies and I would [illegible] together under such an arrangement; they are [illegible] mighty [illegible] in some matters. — I have already agreed [illegible] take an assistant here for this winter. His name is [illegible] Platt Jr. He wishes to study geology, and is to pay for his [illegible] by doing a little work for me every day [illegible] will also be practice to him. It will give me a good [illegible] trouble, I fancy, and there is no paying work [illegible] [illegible] I shall have to get up some work that will not pay, [illegible] not directly, but possibly indirectly in [illegible]

[illegible] is plenty of work [illegible] of just now but none of it seems very likely to be finally [illegible]. The price is a small one in Canada [illegible] a large one in [illegible] (Southdown) and this is through [illegible] [illegible] one in Northwestern Pennsylvania that would [illegible] several months, from now until the [illegible] and again [illegible] perhaps all summer. And this evening [illegible] has been reached to me; I am told that I could probably have if I wished it, a place in the Pennsylvania Rail Road that was formerly held by Lamborn, as "Inspector of Iron and Coal." It would require a good deal of travelling over the road and would leave time for some geological work and give many chances to get such work. It is said that it might perhaps be so arranged that I could be here half the time and the other half at [illegible]. The salary spoken of now is not at all high, but as before said there would be chances for outside work and a good prospect of increased salary if successful. I shall learn more about it tomorrow. I considered the same matter, I think, three years and a half ago, and without understanding it then as I do now, nor feeling them as now the inconveniences of my present precarious business, nor [illegible] that I could live here half the time instead of [illegible] all the time, nor that I could do outside work [illegible]; I gave up the matter. If the great survey in North-western Pennsylvania should be ordered, I would prefer that now to any of the others; but the Ecuador trip would be an agreeable one in winter. Nothing further has come from Mr. Hall about the Hudson River job; but he ought to have written at any rate and may have neglected to do so from his ordinary dilatoriness in such matters. — The Freiberg students are all gone; Richter is at work at Coxe's mines; Peltier is still on his travels in Pennsylvania; and Koenig is visiting at Easton the father of his Freiberg [illegible]. Koenig is the only one of them who is likely at all to stay here. He is a good fellow as said before, but is getting a little annoying with his perfect contempt of American matters and his strong tendency towards the Democratic party. He is young and has travelled so little yet as to underrate what differs from the German standards; and he forms decided opinions on too small foundations, generalizes too quickly by far [illegible].

So good bye for three weeks, if it must be so. Give my love to Hannah and [illegible] me ever very affectionately yours. Benj. Smithsonian.

Report on an Unfinished Set of Trials of a Smoke Burning Furnace at Rising Sun, Philadelphia, under the Management of Mr. John T. Rich; by Benj. Smith Lyman, Mining Engineer of No. 135 South Fifth Street, Philadelphia.

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[illegible]	6	[illegible]	17
[illegible]	7	[illegible]	21
[illegible]	8	[illegible]	21
[illegible]	8	[illegible]	22
[illegible]	9	[illegible]	22
[illegible]	9	[illegible]	23
[illegible]	9	[illegible]	23
[illegible]	10	[illegible]	24
[illegible]	11	[illegible]	25
[illegible]	13		

Main Results of the Rising Sun Shields Charcoal Blowing Furnace, in 1868.

Kind	Fuel	Days in Full Blast	Tons of Pig Iron made	Tons of Coal consumed	Length of Smelting Time	Tons of Coal used per Ton of Iron	Tons of Iron made per Week	Tons of Coal used per Week	Tons of Iron made per Day of 24 hours	Increase or Decrease of Iron per Day
Anthracite	Lehigh Valley Coal	30 Wk.	141	48	3 " 18	552	107	391		—
Fat Lump Coals.	Coal from new Company Pa.	14 "	157	47½	3 " 12	1164	36	7.66		
	Coal from new Company Pa.	15 "	350	49	7 " 7	2540	357	7.26		+18
	Franklin Coal.	9 "	200	53	3 " 44	1491	398	7.45		
	Westmoreland Coal, Pittsburgh Pa.	11 "	400	52	7 " 39	3117	406	7.79		
	Penn Coal, Pittsburgh Pa.	12 "	232	58	4 " 0	1762	4022	7.62		—
	Penn Coal.	16 "	350	50	7 " 2	2680	383	7.66		+10
	Penn Coal.	17 "	350	54	6 " 31	2812	433	8.03		+13
	Sydney (N.S.) Coal.	18 "	281	56	4 " 56	2160	436	7.09		+10
	Pictou Coal.	7 "	169	54	3 " 8	706	289	5.36		27
	Pictou Coal.	8 "	500	54	8 " 30	2792	329	5.58		
Anthracite Coals.	Iron Shot Coal.	26 "	262	51	5 " 11	1956	378	7.47		-11
	Moshannon Coal.	25 "	262	48	5 " 31	2104	382	8.03		-7
	Sargent & Conover Coal.	24 "	329	45	7 " 20	2660	362	8.03		-7
										-17
										-10
										-1
										-7
Hard Coal.	Shenandoah Mt. Mine Coal.	24 Wk.	300	78½	4 " 7	1900	460	6.33		-19
										-26
										-18
										-25
										-23

Some Results of W. R. Johnson's Trials of Fuels for Steam with Commentary

Pounds of water at Tank Temperature to One of Fuel. Average	1st Trial	2d Trial	3d Trial	4th Trial	5th Trial	Average Water at Tank Temperature	Mean Tank Temperature of Each Trial	Fuel	Class
6,31	5,87	6,74	—	—	—	5,12	43°–44°	Cannelton (Ind.) Cannel.	Fat Soft Coals.
7,03	7,03	—	—	—	—	8,25	40°	Pittsburg Coal.	
7,71	8,11	7,[illegible]	7,22	7,73	—	5,68	79°–8[illegible]°	Newcastle (Eng.) Coal.	
7,02	7,15	6,[illegible]	—	—	—	6,01	66°–70°	Sydney (N. S.) Coal.	
7,51	7,[illegible]	7,[illegible]	7,43	7,01	—	13,37	83°–[illegible]°	Picton Coal (from N. York).	
7,47	7,60	7,[illegible]3	—	—	—	12,06	67°–70°	Picton Coal (from Cunard).	
8,67	8,45	8,[illegible]	8,85	8,73	—	11,20	80°–85°	Blossburg Coal.	Dry Soft Coals.
8,70	8,50	8,[illegible]	8,58	8,71	8,56	9,69	46°–68°	Easby & Smith's (Cumb'd) Coal.	
9,51	9,52	9,[illegible]	—	—	—	7,96	78°–79°	Atkinson & Templeman (Cumb'd) Coal.	
8,91	8,91	—	—	—	—	8,38	80°	Easby's (Cumberland) Coal.	
8,19	8,46	7,97	7,99	8,35	—	10,96	54°–57°	Neff's (Cumberland) Coal.	
8,68	8,24	7,12	—	—	—	12,71	76°–78°	N. Y. & Md. Co's (Cumb'd) Coal.	
7,81	7,58	7,94	—	—	—	8,10	51°–54°	Beaver Meadow Coal (Navy Ind.)	Hard Coals.
8,58	8,33	8,82	8,58	8,[illegible]9	—	8,93	48°–78°	Lackawanna Coal.	
7,73	7,7[illegible]	7,35	8,02	7,77	—	7,22	50°–52°	Lehigh C. & Nav. Co's Coal.	
8,80	8,85	8,99	9,09	8,26	—	6,74	81°–83°	Beaver Meadow Coal (Slope 5).	
8,23	8,50	7,98	8,43	8,03	—	11,96	84°–87°	Beaver Meadow Coal (Slope 3).	

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Doubtful Penn Coal Trial. The first Penn Coal trial at Rising Sun (12 Sept.) was imperfect because the injector with which the boiler up to that time had been fed got out of order. After that the boiler was fed by [illegible] pump.

Leaky valve at Bottom of Tank. In the first [illegible] was noticed that the water [illegible] when pumping [illegible] before each trial [illegible] if [illegible] a few minutes, [illegible] called; and this [illegible] change of [illegible] bottom [illegible]. But this [illegible] found [illegible] to the tank that separated [illegible] the well. When the other valve [illegible] the tank to the well was [illegible] in [illegible] minutes (11:09–11:18 on the 17 Sept.; [illegible] minutes (10:58–11:14) on the 24 Sept., nor in [illegible] minutes [illegible] on the 25 Sept. But when [illegible] in this pipe was shut, apparently tight, the water settled [illegible] pounds of the gauge rod, or eight in reality, in ten minutes (10:57–11:07) on the 12 Sept.; and in thirty minutes (10:31–11:01) on 26 Sept. the settled thirty pounds of the gauge rod, twenty four in reality. It is [illegible] that the valve near the bottom of the tank leaked about a pound a minute of the gauge rod,

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and a more careful determination of the amount of leakage was deferred until a more convenient time at the end of the trial, when the tank should not be in use otherwise. The leaky valve was not in use during the trials after the doubtful Pump Coal trial (Wood), because the feeding of the boiler was done with the pump instead of by the injector. The leak is also confirmed by the close correspondence of the average result of the two Coiler Pump Coal trials ($\frac{7.66 + 8.03}{2} = 7.84$), just before and just after cleaning the soot off of the flues, with the ~~[illegible]~~ Coal result (7.79) of the Westphalian coal of the same bed and quality, allowing for a leakage, in this trial, of a ground a minute, gauge rod reading). It is evident that the irregular and interrupted feeding with the injector could not be more advantageous than the almost constant and regular feeding with the pump, but, if anything, on the contrary. Yet the results of the trials where the injector was used would appear much better than trials with the same kinds of coal with the pump, if no allowance were made for this leakage.

Gauge Rod. The water at Rising was measured by a graduated wooden rod upon a float in the tank. It was marked in equal divisions supposed at first

[This page and the [illegible] written after this copy was made]

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to answer to weights of a hundred pounds; but on the 15 October it was proved that they answered to weights of only eighty pounds each, and they have, of course, been reckoned so in the table. The source of the mistake in [illegible] the gauge rod was the leak already mentioned, that lowered the water while the first weighing was going on.

Temperature of the Water in the Tank. The temperature of the water in Johnson's tank could not be very greatly different in the long run from what it was in most of the Rising Sun trials; but in some of the trials at Rising Sun that compare most favorably it may be borne in mind that they were made wholly in the day time in comparatively warm weather, so that the tank water was comparatively warm, while the corresponding trials of Johnson were made in cooler [illegible] and almost all of his lasted through the [illegible] as well as the day, so that the tank water must [illegible] been cooler on the average. Still, this difference would amount in the result to only about one [illegible] for every ten degrees of temperature (Fa[illegible]); and it was therefore not thought worth while [illegible] the roughness of the trials in other respects to note the temperature of the tank water at Rising Sun.

It may be mentioned, however, that the tank water in Johnson's trial of Pittsburg coal averaged (40°) probably nearly thirty degrees less than in the Pennsylvania Westmoreland and Franklin coal trials at Rising Sun. On the other hand, in the hard coal trial at Rising Sun the tank water was probably as cold as in the coldest cases of Johnson's hard coal trials. In the Cannel coal trials the tank water was probably twenty degrees warmer at Rising Sun than in Johnson's trials.

Temperature Expansion of Water in Iron. The Rising Sun apparatus had no means of testing the warmth of the water in the boiler any more than of that in the tank. Of course, as the boiler and tank (both of iron) expanded with the heat they would change their capacity, but the water would expand at the same time in a greater degree. According to Johnson the apparent expansion of water in iron from 68° to 220° (Fahrenheit) amounts to four per cent. This was considered by him in restoring the level of the water in the boiler at the end of a trial to what it had been at the beginning. But in the Rising Sun trials the temperature as roughly shown by the pressure of the steam was about the same at the beginning as at the end; so that no allowance on this score

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was made. A corresponding apparent expansion of the water in the iron tank must have taken place; but this was shown in the British trials of fuel to be only about one fifth of one per cent. between forty degrees and eighty degrees, in significance therefore as compared with other sources of inexactness in the Rising Sun.

Temperature of Steam. The Rising Sun apparatus has no [illegible] of testing exactly the temperature of the steam; but the pressure of the steam (about 113 pounds) as shown by the steam gauge, will give some idea of its temperature. This seems to be so much higher than in Johnson's trials as to be equal to about two per cent. in favor of the Rising Sun trials ($\frac{1024-1005}{1005} = 0.02\pm$).

Temperature of the Air. For a perfect comparison it would have [illegible] necessary to note the temperature of the air during the Rising Sun trials; for the warmer it was, the less cooling effect it would have upon the fire and boiler. Owing to the weather and the time of day in which the most successful Rising Sun trials were made, as compared with the corresponding trials of Johnson, the advantage in this respect would seem [illegible] on the side of the Rising Sun trials; but it was not thought worth [illegible] to note the

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[illegible] of the air in Trials thrown as high as [illegible] will make not very much greater [illegible] [illegible] [illegible]

the temperature of the gases in the stack, to show how much [illegible] in that way. In Johnson's experiment he found that about one sixth of the corresponding power of soft coals was expended on the products of combustion that escaped through the chimney. In order to determine this point carefully, a set of analyses of the gases of the stack would be needed; and much greater experience than the importance of the matter seemed to [illegible]. It is probable that the loss of heat in this way in the more successful rising hearth did not vary much from what it was in [illegible] sons trials, perhaps but more than five percent of the whole [illegible] coal; but that in the less [illegible] it accounts for most of the difference [illegible] their results and Johnson's. It is [illegible] the main loss in these unsuccessful [illegible] unburned fuel carried off in the [illegible] but from far too much air drawn [illegible] and carried away through the [illegible] the [illegible] means of measuring the [illegible] draft through the [illegible] the rising [illegible] appearance. It would [illegible] to determine the amount of the gases

just mentioned and the amount of heat [illegible] by them as well as the amount of air drawn through the grate and its cooling effect. This measurement could be made by help of a syphon or water gauge in the stack and by other means [illegible] would [illegible] much [illegible] importance without the corresponding determinations already mentioned of the temperature, moisture and barometric pressure of the air and the temperature and composition of the gases in the stack. It is likely that the draft in all the Rising Sun trials, except the hard coal trials, was about as well adapted to the grate and heating surfaces as in Johnson's trials.

Grate and Heating Surfaces. In Johnson's trials the ratio of the heating to the grate surface varied from 35 [illegible] to 1 [illegible] to 1 [illegible] at Rising Sun, according to Mr Rich's statement that the heating surface is 116 feet and the grate surface in most of the trials is 5 in. × 24 in. = 1 [illegible] feet (exact measurements of these and other dimensions of the boiler was deferred until the oil burning furnace should be tried, when the coal furnace would be cold) and reckoning roughly the two side blowholes with their steam jets and the front blowhole without a jet (estimating the three round

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blowholes as two inches and a half [illegible], or five square inches in area (3×5=15), and equal without a jet to four times the same surface of grate (4×15=60), and the jet of steam at 43 lbs. as multiplying the air force [illegible] by the two side holes by nine (60+80=140), [illegible] having the [illegible] [illegible]) as equal to a square foot of grate surface without a jet; the ratio of heating grate surface would be equal to [illegible] to one [illegible] in all the trials except the second Cannel, the dry soft coal and the hard coal trials. In the second Cannel trial the real grate surface was half bricked up, so that the ratio may have been equal to say 90 to 1. In the dry soft coal trial the front blowhole was kept shut, which changed the ratio to say 60 to 1. These high ratios were all favorable to the use made of the steam jet in the same heat with the continuous grate surface. In the hard coal trial, however, all the blowholes were stopped up, but the grate surface was enlarged to six feet; so that the ratio was about 20 to 1; and this ratio is much too large for the use made of the steam jet in the smoke stack. It is very clear that much heat was lost in the hard coal trial; and the [illegible] stack was at one time so hot as to set fire to the

[illegible] [illegible] [illegible] [

air were between the boiler and its brick covering, as the
this must have taken up and wasted a certain a-
mount of heat; while at Rising Sun the hot air pas-
sages were all flues within inside of the boiler, and the
brick covering was only heated by the outside of the
boiler. The covering of Johnson's boiler exposed a much
larger surface to the outer air in proportion to the a-
mount of fuel burned than the case at Rising
Sun; and Johnson's experiments lasted also a
much longer time in proportion to the weight of fuel
burned, so that the wasting of heat from the outer cover-
ing continued a longer time. But the amount of loss
in this way must be little in either case, probably
much less at most, than the one sixth of the whole
evaporative power already mentioned as lost through
the chimney; for in adding this lost to the other five
sixths Johnson obtained in the best samples of [illegible]
very nearly the theoretical utmost evaporative power
of the best coal. It is probable, therefore, that the loss
in this way at Rising Sun amounted at most hard-
ly to one per cent. of the whole evaporative power
of the fuel more than in Johnson's trials. The loss
of heat in this way from a [illegible] running at high
speed must be much greater than it was in the shop

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covering.

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the grate at the beginning of the trial was of a different [illegible] from the end of the trial, sometimes a little better, but probably [illegible] worse. The average amount of fuel burned in each trial was about three hundred pounds so that a difference of only three pounds in the estimated amount on the grate at the beginning and end of the trial would make an error of one per cent. and the uncertain amount of ashes in the grate at the end of the trial added to the difficulty of the estimate. As the charge of fuel was only twenty or thirty pounds and the grate quite small it is not likely that this error could amount to more than two or three per cent. at most with the soft coals. With the anthracite the grate surface was large (six square feet) and the amount of ashes so large apparently as to make the fire much higher at the end than at the beginning of the trial; and the whole charge of sixty-five or seventy pounds made so little show comparatively on the fire that an error of twelve or fifteen pounds, or four or five per cent, in the final estimate would not have been very noticeable, even if the grate had been free from the great quantity of ashes. Fifteen pounds of hard coal, forming a single spread over six square feet of grate would make a thickness

of two thirds of an inch, in lumps. Johnson's trials were free from such error, because he fired up with wood whose heating power was tested, and at the end the coal burnt out as thoroughly as possible.

Composition of Fuels. No careful analyses either on a small scale or on a large one were made of the different fuels used at Rising Sun; and so it is impossible to compare the ashes and moisture of these fuels with those of Johnson's trials. It is not likely that the coals of the two sets of trials varied very much in regard to moisture; for in Johnson's trials it amounted commonly to only one or two per cent, in all, of the whole weight of the coal. The variation in the amount of ashes in different samples is caused greater, and affects seriously the results of the trials. A general estimate only of the ashes and slate in the Rising Sun coals could be formed simply from their look and from the frequency of raking them out from the fire. The Penn and Westmoreland and Franklin coals were carefully selected, and seemed remarkably free from slate and other impurities. The Sydney coal also seemed to be comparatively free from ashes. The Cannel coal was rather pretty often thrown out of day. The George's Creek and the

Shannon coals seemed to have a moderate amount of ashes; the Snowshoe coal, though looking likewise bright and clean, free from slate and sulphur, really seemed to have more ashes. The hard coal either had a considerable amount of ashes, or much was left on the grate unburned at the end of the trial; in either case the waste was notable. The difference between the Rising Sun Coals and Johnson's in respect to ashes and clinker might well amount in some cases to five per cent., or more, since his coals varied in that respect from five per cent. of the whole weight of the fuel to eighteen and a half.

Charges. The charges in Johnson's trials were about a hundred pounds each; at Rising Sun they averaged about twenty two pounds (5 to 9), or less than a fourth of Johnson's charges, although the hourly amount burnt was about half as great. Of course, this greater frequency of charging decidedly helped the Rising Sun trials, but it is impossible to estimate how much per cent. The pushing back of the coal from the coking plate to the grate, and poking it up while on the plate, which took place one or the other, about once in five minutes, was also in a manner a charging of the fire as often, as it

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of heating surface, the strength of the draft for the [illegible] [illegible] grate and heating surface (except in the hard coal trials) and the temperature of the gases in the tank [illegible] corresponded well in the two sets of trials; the [illegible] of the air and the expansion of the water in the iron tank and boiler helped the Rising Sun trials slightly more than Johnson's, but to an unimportant degree; that the temperature of the water in the tank generally corresponded well in the two sets of trials but probably helped the Rising Sun Cannel coal trials by two per cent, and the Franklin, Wistonwood and Pennsylvania coal trials by three per cent, as compared with trials of similar coals by Johnson; that the errors in the results of the Rising Sun trials from leak of proper glass gauge may have been two or three per cent, from imperfect correspondence in the amount of coal on the grate at the beginning and end of the trials perhaps two or three per cent, and in the hard coal trial four or five, from uncertainty as to the composition of the fuels as compared with the corresponding ones of Johnson perhaps five per cent; and that the too strong draft for the grate and heating surfaces in the Rising Sun hard coal trials caused a very great loss of heat. It is likely, therefore, that, except in the

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coal, which Johnson says resembled very closely less in appearance and composition the Pittsburg Coal; and these results agree very well indeed both in the mean and in the extremes.

Sydney Coal Cuvinging. There are several beds of coal at Sydney somewhat different in quality, and it is by no means certain that the Sydney Coal of the two sets of trials was the same. The one burned at Rising Sun seems to resemble the coal of the Pittsburg bed more than the one burned by Johnson does. The Rising Sun trial of Sydney Coal was but a single one in a very warm day, and the coal was very free from others; and the result was seven and a half per cent. better than in the first of Johnson's trials of Sydney coal. In his first trial he had the air plate at the furnace bridge closed; in the second it was open and the temperature of the gases in the chimney was forty degrees higher than in the other trial, owing probably to soot on the flues, so that there was both more air admitted and it was raised to a higher temperature.

Hard Coal Trial. The hard coal at Rising Sun is said by Mr. Rich (on whose authority the names of all the coals are given) to be Sugar Loaf Coal. The coal from Sugar Loaf is known to be from the same bed as

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Shield Coral. The main Top of this [illegible] Coral is [illegible] Shield-like, and [illegible] Shield Coral. [illegible]

The drinking quality of Water is [illegible] by having mixed with it a great quantity of [illegible] Lime; but in the White Coral and Madrepore stone of which Islands many have been [illegible] Lime-stone, although [illegible] Lime.

Soil and Climate in General. Islands [illegible] Soil [illegible] Soil [illegible] Soil

that there would seem to be no more than five per cent. to save by burning it, and with greater care even much less in smoke. If however it be attempted to burn up this small amount of smoke thoroughly by letting in more air to the fire, there is great danger of having so great an excess of air as to more much more by its cooling effect than is gained by burning the little smoke. If enough air should be let in to burn the smoke just after charging, when the smoke is thickest, that quantity would be too great when the smoke becomes less, and would cause a waste of heat. In order to have the production of smoke as uniform as possible, there is a necessity to charge as often as possible by lessening of course the size of the charges; but perfect uniformity and complete saving would only come with continuous charging. The greatest saving in smoke burning is perhaps in its keeping the flues comparatively free from soot, so that the gases in escaping carry off less heat; but at firing there some soot is formed in starting the fire with wood and soft coal, although the fire might be started with charcoal or coke.

Some Authorities. Robert Armstrong, in 1855, strongly condemned all smoke burning apparatus as far as fuel saving was concerned. Bourne condemned the idea likewise in notes to Armstrong's paper and in a paper written in 1843; and in 1857 speaks of its general lack of success, not saving, but says that with

135 South Fifth Street, Philadelphia; 3 Nov. 1868.

J. W. Harden Esq.
Wilkesbarre.

My dear Sir:

I have succeeded at last in finding out Mr. [illegible] address and in finding him at his office. Mr. Ledley owing to his debility [illegible], was unwilling to bind himself to be here on any day but those when the meetings of his society compel him to be here; and this month these are the sixth and twentieth. The sixth is too soon for your purpose; but the twentieth of November would seem to be [illegible] and Court Winter says it will suit him as Court Winter and Mr. Ledley too, will need to know, of course, [illegible] what [illegible] and what hour they must appear and will expect information on that point from you or your [illegible]. Mr. Maney the other day seemed to know nothing about the [illegible] from having heard nothing or nothing definite from you about it. He said however, that there would be no need of coming here at the time the testimony is taken. After the twentieth Mr. Ledley will be living in the city here, and can probably be more at liberty about appointment of several days in advance. Mr. Maney said he had no commission authorizing him to act in the matter, and lacked information as yet about the affair.

I do not happen to know of any such architects journal or periodical as you inquire about; but if I should hear of one in this country I will let you know. Very truly yours. Benj. Smith Lyman.

35 South Fifth Street, Philadelphia, 3 Nov. 186[illegible].

James M. Barnard Esq.

My dear Sir:

Your favors of the thirty first and of the first enclosing the three dollars and forty cents for the mapphotographs, have this morning come to hand together. The remaining ten photographs were mailed to you about Thursday last. Hoping that they came safely and promptly to hand, I remain

Very truly yours.

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 4th [illegible]

To Mr. Marc Queen Esq.

Sydney, C.B.

My dear Sir:

Not hearing anything from you in regard to the feasibility of the plan I proposed for improving my lot of land by a well laid out road through it, I conclude that it does not strike you as likely to pay remarkably well for the outlay it would cost. It is now too late for me to do anything about the road this season even if it were desirable, and the return for the expense of making it next year would come so late, that I am inclined to have the land sold right away, before it is exposed to the dangers of theft another winter. Besides I should be very glad [illegible] what money may come from the sale; owing to the fall in [illegible] it will be ten or twelve percent. less than it would have been [illegible], and may be still less if the sale should be [illegible]. This of itself would make up for some difference in the [illegible] in Nova Scotia currency. I hope, therefore, that [illegible] the sale of the land and forward to me whatever balance [illegible] in my favor from the proceeds, at the earliest possi[illegible].

[illegible] heard by this time the admirable result of our [illegible] it will have the effect soon of reviving business [illegible] will be [illegible] to by and by, and that the Cape Breton [illegible] will share in our returning prosperity. The victory [illegible] as important as that of Lincoln's election four years ago, and [illegible] more important than that of [illegible] any other battle. Give my [illegible] to your wife and niece and believe me ever

My affectionate yours. Benj. Smith Lemon.

135 South Fifth Street, Philadelphia, 4 Jan. 1868.

Edward R. Howe Esq.

Cambridge, Mass.

Dear Cousin:

Your favor of the second of last month came duly to hand and ought to have been answered sooner; but lack of leisure to do so has been the main cause of my delay, and it is now perhaps too late for this to reach you before your arrival here. You will be very welcome to my room and a fa bed, and they will probably take your [illegible] without any restriction as to Friday nights in future, except possibly the Friday night of this week. Mr. Lesley will be boarding in town here with his family before the twentieth, when the next meeting of his society takes place after this week.

You surprise me by seeming to speak of going into the iron making business as a [illegible] of [illegible] Engineering, and what is more, of science in general. It seems to me most decidedly one branch of [illegible] engineering, and the great steel works of the country are and will be managed in great part by well educated mining engineers, and many of the iron works must be too, as soon as such men are less rare here. And in connection with the manufacture of iron and steel there is certainly room for an immense deal of study and scientific skill as well as invention and improvement. In urging you to take even a humble position in connection with some iron or steel works, I did not mean to recommend you [illegible] any lower in the scale than was necessary to get connected in some way with a satisfactory establishment; you would quickly pick up any details that you would have got in any still lower position. But if you should hold even such a place as you say your friend does as bookkeeper at some iron works, I cannot believe that your employers would long allow you to hide your candle under a bushel in that way. You would at any rate have a fine chance for becoming intimately acquainted with the making of iron, and if unappreciated by your employers could do better elsewhere. I am much [illegible] that you hope for something better than money making; but [illegible] in learning can perhaps be got best when one's labors are so well [illegible] he has leisure for study and freedom from anxiety about his living. This is more likely to happen in such a business as iron making, [illegible]

the demand for science and skill is likely to be so very great and the employment is so regular, than in geology that is so precarious. Still a man's taste must be suited about his business as it must be in the choice of a wife, and if you prefer geology with all its drawbacks, iron making pretty and good. Mining proper, if you prefer that, is also a good business as iron making is, though less good than iron making. But your impression seems to be that mining the metals is better than coal mining [illegible] skill. There is ample room for the exercise of skill in coal mining, perhaps quite as much on the whole as in ore mining; and it has the immense advantage of far greater certainty [illegible]. As for geology that is interesting to the geologist [illegible] less so in coal mining regions than in the ore mining. If you prefer surveying in connection with mining and geology [illegible] chance certainly seems the most promising, as indeed it is perhaps the only one of any kind at present. There is an opening in the employment of the Pennsylvania rail road that I have under consideration myself at present which I think would be a still better place for you. If you could bring your mind to like it, and I think you would be a good [illegible] for the place, or at least would quickly become so. The [illegible] would perhaps not be very great at first, but there would be a certainty of [illegible] if the [illegible] valuable and the chance of [illegible] better places under the Company or elsewhere as well as the chances for outside work would be good. As to the duties I cannot speak very fully yet but they are connected with coal and iron and would require mining engineering training to a certain extent, though do then out of the special line to which I have now for a good while been specially devoted and consequently not as good for me as for you. They would require also a good deal of travelling back and forth on the road and living at Altona, which last would be especially distasteful to me, although not probably unacceptable to you. On the other hand the constant travelling would not be agreeable to you as a married man. For me, the place would put me in the way of geological work and leave me some leisure for it, and it might do the same for you. There was an immense survey in Northwestern Pennsylvania talked of a few days ago, that I thought might give you a few months of work as my assistant if you were willing, but it seems to have fallen through as far as I am concerned.

Hoping that to see you soon, I remain

very truly yours Benj. Smith Lyman

135 South [illegible] Street, Philadelphia, 5 Nov. 1888.

[illegible]:

[illegible] very welcome favor of the thirty-first came [illegible] yesterday. I am very much obliged to you for the attention you have given the case of my cousin James Fowler; and am glad to hear by you that you saw him this summer. I thought myself that if he could find a place with you it would be in a measure as your [illegible] he would for that reason be content with a smaller pecuniary compensation, but that he might make himself on the whole of more use than hindrance.

I am glad to see by your letter that you are apparently permanently established at West Stockbridge, and with a good prospect, I should think, of enlarged business next year; and your situation [illegible] I am enviable one. It would be so even outside of [illegible], but seems remarkably so in a state whose next [illegible] does not contain a single democrat. Then, too, Berkshire County is a beautiful region to live in, although West Stockbridge [illegible] may not be the most agreeable place there. Indeed I should at [illegible] to tear myself away from Philadelphia and go [illegible] to live myself, on a small salary. If I go to [illegible] Thanksgiving as I hope to, I must I shall be [illegible] Stockbridge as you suggest [illegible] I have, besides, been wishing for [illegible] relatives in Old Stockbridge again. If I shall be able to [illegible] way I will try to let you know of it definitely before the time comes; but in any case I should be sorry to have you alter your plans on my account. I did think I might have occasion between this and Thanksgiving to go to Albany, and that I could then stop in your region on the way to [illegible]; but I have pretty much given up that idea.

I send you herewith a photographic copy of a little sketch. I made of a little [illegible] in Western Illinois that I looked at [illegible] out there last summer. Business in my line continues very dull, although there has been some talk lately of large [illegible].

Cox was in these parts two or three weeks ago, and I [illegible]

a little of him. As he is now a married man he comes much seldomer to the city than when he was courting his bride, and when he was here it was ten miles out from the city with [illegible] Her family have 8600 acres of land in the outskirts of the city, [illegible] a little garden plot. He represents her as a most excellent, [illegible] young lady, who lives most contentedly in the country upon the mines, and is interested in natural history, particularly botany. While Coxe was here there arrived from Freiberg young Richter, who was a poor boy at the mines in our [illegible], but got from Brault the idea that he could be educated, and finally in my time succeeded in getting admission to the Bergschule. [illegible] that he has gone through the four years' course of that school, and studied two years at the Academy, and now with the help of the Americans and professor Cotta he has come to America under the protection of Dr. Koenig who paid his fare across. Richter brought a good letter to Coxe from Weisbach with whom he had worked abhorrying, and Coxe took him at once into his employment and they went up to the mines after being here a week or so. Coxe is beginning to print his translation of Weisbach's Believe; at any rate he got the plates sometime ago from Germany. Dr. Koenig is a young German from Baden who has studied at Heidelberg, Berlin and lately at Freiberg; and has now come to seek his fortune as a metallurgist or chemist. He is much inclined to go far west in the Spring, say to Montowan. He talks English pretty well, but Richter scarcely a word. As Richter was in the steerage they got separated in New York, and by mistake came here in different trains; but Richter managed to find me early the next morning after his arrival, and we afterwards met Koenig at Coxe's office. The same week came Pettee, lately from Freiberg and late "president" of the colony there, and originally from Newton Mass. He staid a few days and then went on a tour of inspection through the Eastern Penn. iron and coal regions. He went to the Academy meeting and joined two or three spins in a visit to a restaurant afterwards, [illegible] the same set that you saw after the Academy meeting when you were here. We commonly go, six or [illegible] in [illegible] to a lager beer saloon nearby, after the meeting and keep there until eleven o'clock; but now the weather is cool, we can [illegible] in the open air, and the [illegible] may be broken up.

Ever affectionately yours. Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 5 Nov. 1868.

Wm. C. Jones Esq.
Knoxville, Ill.

Dear Will:

I have been meaning ever since my arrival here to write and let you know of our safe return to the East, but have had little leisure for the purpose and have understood that the girls had already written, probably more satisfactorily than I could have done. Perhaps they have left nothing for me to say, but I fear their modesty prevented them from telling you of the great benefit their characters had received from that eloquent discourse we listened to so attentively at the Swedish Church. It is not the slightest exaggeration to say that no sermon since that has impressed me anything like so much, except perhaps one at Florence, in Northampton; in fact I rather avoid hearing sermons now for fear of dulling the edge of that remembrance. All ministers now seem, of course like stupid drones after that animated one, or would seem so if I saw them at all. But what shall I say of the appearance of all young ladies now? After seeing those Swedish beauties [illegible] I am quite spoilt and can hardly look even at school girls of Philadelphia who used to seem so pretty. I wonder how my travelling companions could have taken any pleasure in the attention lavished upon them by the young gentlemen of Chicago, both those living there and those from abroad, after having their standard raised so high by the

golden-haired Swedes. It is true that Fanny seemed much lost to reflection upon them after we got out the lakes, particularly in sweeping Lake Michigan. You might have seen her sitting or lying on a sofa then by the hour together silent and no doubt lost in contemplation of these Swedes. Sometimes her face had a look of despair, and once she looked as if she might jump into the water and swim back to Chicago on her way to revisit the Charmers. But we got her safely to Cleveland and on the Cars and she seemed then to take the separation more philosophically - probably the hilly and mountainous country we came to before reaching Pittsburgh called to mind the varied, picturesque surface of Scandinavia and she may have reflected that she was going straight towards that favored land. We succeeded in stopping her finally at Northampton but Mary shot on as far as Boston before she came to a fixed rest in her eastward progress. One thing that made them both comparatively contented for a few days at Northampton was the interesting scientific meeting there. They went pretty regularly to all the meetings there, but not so regularly as at Chicago where they were marvels of constancy in the cause of science. In fact they not only attended the scientific meetings there, but were constant attendants at all the evening parties, of which there were five besides an excursion on the lake. I left them a day or so at the end of the meeting to look at a piece of land in Henry County for Mr. Jas. Vol. Barnard of Boston, who had written to me to do so; and I send you herewith a photographic copy of a little map I made of it after I got home.

Give my best regards to Mary, and believe me that I, as well as the girls love you with the greatest pleasure on your visit at Knoxville, and am

Ever your affectionate Cousin. Benj. Smith Lyman.

Mrs. [illegible] White [Copied from memory 12 Nov. 1858] 135 South Fifth Street, Philadelphia, Nov. 1858.

My dear Madam: I am going out of town today, and regret that I shall not be able to attend the meeting of the German Conversation club this evening.

Yours truly yours. Benj. Smith Lyman

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135 South Fifth Street, Philadelphia, Nov. 1858.

Mrs. S. B. Lyman,

Jamaica Plain, Mass.

My dear Ann:

Your favor of the twenty first of September came duly to hand, and should have been answered sooner. I was not disappointed in receiving no invitation to the wedding; for I understood [illegible] that your house would be crowded with company. It would have given me great pleasure, if it had been possible, to be in those parts at that time even if I had gone to a hotel in Boston; but it was quite impossible for me to leave here then. Indeed, I hardly think I shall be able to accept your kind invitation to visit you sometime this winter. I may perhaps get as far as Northampton at than to giving time, but even that is doubtful. — I have heard with interest and pleasure of Eva's marriage and wedding trip and apparent happiness, and am very glad that she is at last married after so long and tedious an engagement. Not that it was tedious, I suppose, for anything but its length; but they say that hope deferred is sickening. It always seems a great pity, too, if people are to be married at all, that they should lose from married life a considerable number of their best years in a matrimonial point of view, at least five in her case. I fear she has already gone to Savannah by sea and [illegible] there is now no hope of seeing her as she passes through this city.

I sent Uncle [illegible] the other day a photograph of mine lately made for Mr. James Barnard. Please give my love to him and Nelly and Bessie Clap, and believe me ever

Your affectionate [illegible]. Benj. Smith Lyman.

135 South Fifth Street, Philadelphia, 10 Nov. 1868.

Edward [illegible] Howe Esq.
Cambridge, Mass.

Dear Cousin:

Your favor of the sixth has come duly to hand, and I am glad [illegible] by it that our views agree far better than I had supposed [illegible]. Even if you should become concerned in the iron business you will perhaps have no cause to regret that you have studied [illegible] Freiberg and Paris instead of devoting yourself exclusively [illegible] make iron here and in England; though it is indeed to be hoped that this [illegible] engineering has not been specially neglected by you. You have probably not come anywhere so nearly [illegible] any of the subjects you have studied as if you have [illegible] whole time and attention to it alone; but you have made [illegible] you can get the rest from books and observation, in any one branch.

Perhaps my last letter led you to look on the Penna. R. R. [illegible] little too certain. I was so far from being able to offer it to you, that I had not even the chance of taking it myself [illegible] have [illegible]. Since writing I have heard nothing further about it; but if I should hear anything of importance to you I will let you know right away. If the place should prove to be a desirable one for me I should hardly feel able to [illegible] it even in your favor; but I hardly expect it will; and yet I think it would be a good place for you and that you would be a good man for the place, and I should try hard to get it for you. If I [illegible] myself it might lead me to the knowledge of some place that you would like.

The Grand Survey in N.W. Penna. there is now probably no further hopes for; and the season is getting so late [illegible] [illegible] field work [illegible]. It is said, however, that coal men are making a profit [illegible] dollars a ton.

I have some hopes of going to Northampton for Thanksgiving as you suggest; but that [illegible] you [illegible] either before or after that, as may be convenient to you. If [illegible] should be any special [illegible] being here soon I will let you know at once. [illegible] yours. Benj. Smith Lyman.

[illegible]

Edward T. Horsey,
Cambridge, Md.

[illegible]

135 South Fifth Street, Philadelphia, Nov. v. 1858.

Leo Lesquereux Esq.

My dear Sir:

Your most welcome favor of the eighth is just [illegible]; and I am [illegible] to hear by it how you are getting on, and that your wife is better now.

My manner of sending you a copy of the Barnard Fossil Map was unfortunate, and has led you into a great mistake. I wrapped the map up in an old copy of a report on a [illegible] [illegible] [illegible] for I happened to have some copies of this report without [illegible] in there and thought one of them would [illegible] to give [illegible] and substance to the loose map and bring it to you [illegible] crumpled condition than otherwise. This will account for the gross discrepancies between the map and the [illegible]. In looking over the report, however, the other day I was pretty nearly convinced of what I suspected at the time [illegible] and more, that the coal bed mentioned is it as the Freeport Upper bed, on the authority of the State Report, was not that but Lesley's Coal C, and that there was perhaps another coal (B) just above a ~~[illegible]~~ bed of fireclay mentioned as 100 feet above XII. That survey was but a rough one and perhaps the section is not given quite right; in particular the Conglomerate XII ought perhaps to be given as extending further up into this 100 ft. of "unknown"; and what is given as "Mahoning Sandstone" may be the Sandstone below Lesley's Coal D (Lower Freeport). But I blame the State Report for these mistakes, if they were such

[illegible] not believe that the survey of that part of the state was very thoroughly done. I fancy that you will find the section on the map of the Barnard Tract (Henry Co. Ill.) more in accordance with your views; and you will see that both Coal 1C and Coal 1B seem to have [illegible] opened near the [illegible] of the Tract, and that they seem to be about 50 ft. apart, and that Coal 1C (which seems to be worked two or three miles to the west) seems to be a foot or more thicker than Coal 1B (which is two feet and a half) and of [illegible] quality.

Now to answer your inquiries as far as I can. Mr. Lesley has been here now some six weeks living at his brother Joseph's ten miles out on the Cemn. R. R. and coming in to the library every day or two. He is working on the catalogue of the library and means to finish it up this winter, and he is careful about undertaking other work at present. About the end of this week he is coming into the city to live, to board at a house on Third Street, between Spruce & Walnut, and his wife and daughters will join him there about the end of next week. They leave Keene [illegible] make some short visits on the way here. They are very well, and Mr. Lesley says that Mary has changed very much [illegible] was in Europe, and has become now a woman grown; but that Maggie seems to have changed but little. Mrs. Lesley's own health seems to be rather improving, I should think, He looks very well, but is easily [illegible] a little over work or [illegible] excitement, and has to be very careful; more careful than he is [illegible] to be, and he is now and then downright sick for a day or two. Last Friday night at his Philosophical Society he read a Eulogy on Mr. [illegible], a lawyer who died here a couple of years ago, the same for [illegible] Lesley [illegible] the [illegible]. The last few days Mr. Lesley was [illegible] Occupied [illegible] with getting a good number of additional [illegible] put up in the different rooms of the library, and arranging some system especially for his convenience in making the [illegible]. Mr. Lesley [illegible] to Ithaca before coming back here from Keene, and declined the professors [illegible] the salary was not satisfactory. Mr. Hartt, one of the Brazilian [illegible] [illegible], was appointed to the place [illegible] Agassiz's influence. He [illegible] [illegible], be very glad to hear of you [illegible] this letter of yours. So will [illegible] father and his family at Northampton. [illegible] were all well at last accounts [illegible] now [illegible] looking forward to thanksgiving, now so near, [illegible] [illegible]. [illegible] my health is excellent, as it always is; I have scarcely any work to [illegible] your [illegible]; but I hurt my prospects for next year [illegible] better. Indeed, there was [illegible] [illegible] ago, but all the projects seem to [illegible] [illegible]. [illegible] [illegible] [illegible] very affectionately yours. Benj. Smith [illegible]

[illegible] South Fifth Street, Philadelphia, 12 Nov. 1868.

Mr. Felix Foucon,
Paris.

My dear Sir:

The most welcome gift of your book (Histoire du Travail) came this summer just after I had begun a journey that lasted a number of weeks, and I have but just found the leisure to read it quite through. It is extremely interesting and is really an admirable product of very varied information, broad views and skillful writing. As an American I cannot but feel very proud of the praise you bestow upon America and grateful for it; and yet, if I mistake not, while you were here you had no chance to see for yourself that portion of America whose civilization is most advanced, that is, New England. It seems as if America were always destined to be better appreciated and understood by Frenchmen than by other foreigners; certainly the best books on America so far have been written by Frenchmen. I trust that France will, indeed, as you urge, replace her fondness for military glory by better aims, before it is too late.

You have no doubt fully sympathized with us in our grand political success at the November presidential election. It is to be hoped that Grant will prove faithful to the more advanced political ideas to which he owes his election; but the democrats confidently claim that he will soon forsake his party, and perhaps be even impeached. This time assassination will clearly do them no good, for his successor and Coffax successor would be even more radical than they.

I remain, my dear Sir, very truly yours. Benj. Smith Lyman.

I send you a little photographed sketch map lately made for [illegible] in Illinois.

[illegible]

[illegible]

[illegible]

135 South Fifth Street, Philadelphia, 3 Nov. 188[illegible]

[illegible]

State University of Minnesota.

[illegible]:

Mr. Lesley has handed me your letter of the sixth to him, and I have been much pleased to learn by it how you have been getting on of late years. I have often inquired of him about you, and heard [illegible] that way of your marriage, and perhaps even of your removal from Chicago to [illegible]. But last summer in Chicago I tried to find [illegible] if possible, but without success.

I [illegible] know what Mr. Lesley wrote you about himself, but I will probably not be sorry to have another version of the same story. In 185[illegible] and [illegible] you probably know already he was very busy as [illegible] American Iron Association here, collecting statistics of the [illegible] manufacture of America and writing the "Iron Manufacturer's Guide" [illegible]. He travelled about a good deal in collecting these statistics, and Mr. Lesley and I [illegible] a good deal more especially in the Southern and Western States. In 1859, Mr. Lesley took charge of a very large tract of land thousands of acres, near Beaver Meadows, in the Anthracite Region, with me for his assistant for some [illegible] months. It was a topographical and geological survey; and at [illegible] time he was [illegible] with other matters so that he was only there now and then. Some time before this he had become Librarian of the American Philosophical Society here, and that occupied him somewhat, as well as bringing him a small salary, but left him free to be away from home at times; and he still holds the place.

P.S. Mr. Lesley returned to Winnipeg [illegible] he looks well and is not [illegible] and means to [illegible] at [illegible] they left the [illegible] again [illegible] Mr. Lesley [illegible]

In 1860 the great survey was suspended without, I believe, ever being finished. Geological business was very dull until 1862, but there was probably something of it. In the meantime he became interested in a plan for desulphurising coal and ores partly invented by J. D. Whelpley, partly by himself. They got a patent in which Mr. Lesley had a share, and, I believe, invested pretty much all the money they had in a coal yard and establishment to carry out the scheme; and by the fall of 1862, or even earlier, had lost all. Jo, by the way, had been assistant on the Kentucky state survey in 1859, and after wards on the Arkansas State survey, both under Owen, but about 1860 owing to the great dullness of geological business took a secretaryship in the office of the Penn^a R.R., and is still there. Three years ago he married a very nice wife, a Miss Davis, of Ithaca, N.Y., and he has now a little son about fifteen months old. He lived several years out at Germantown, in the country, but has now been nearly a year living at Rosemont, ten miles out on the Penn^a R.R., on a little place he has bought there. In the summer of 1862, Mr. Lesley found relief from the worry about the coal yard, in a trip to Cape Breton to make a topographical and geological survey of some coal lands there, not far from Sydney. Through the fall and winter of 1862 and the beginning of 1863, little geological business was done; only one topographical survey of a considerable coal tract near Pottsville, where I did the field work; but Mr. Lesley always found something to occupy him at the Library; for he had begun early to make a complete catalogue of the 30,000 volumes there. You know yourself he has a way of finding a plenty of hard work. In the summer of 1863 he went again for a few weeks to Cape Breton; and in the fall he was sent to Europe for some three months, about some patents and had to travel about there somewhat between the capitals. In 1864, the great geological harvest took place; everybody was crazy about mines and oil wells, and Mr. Lesley had that year a taxable income of some $18,000, and in 1865, some $13,000, I believe. The excitement and fatigue, however, nearly broke him down, and he had to withdraw himself partially from work, and in the fall of 1866, by the urgent recommendation of his physicians he went to Europe, and was gone a year and two thirds. He spent most of the time in the Earth of Europe, and in Egypt, and his wife was with him. He was at the same time U.S. Commissioner to the World's fair at Paris in 1867. He has [illegible] written all about his children, how his two little girls are growing up finely, indeed [illegible], now fourteen [illegible] is already a grown woman. They have been at Rome two years. Meggy, the younger is about [illegible] old, she is quite a beauty and very bright, and a great thrower. Mary is quite a musician, and a fine [illegible]

35 South Fifth Street, Philadelphia, 13 Nov. 1858.

Prof. James Hall,
Albany, N. Y.

My dear Sir:

Mr. Lesley desires me to write you for him, he is so busy, and ask if you have yet no definite appointment to make with him for his testimony in the lawsuit you spoke of to him; he fears you may have already written about it and that your letter has miscarried.

The Irving survey you wrote me about some time ago has probably been ordered before this; but in case it should not have done so and it is to be ordered, I take this opportunity of begging that you will let me know as soon as convenient, so that I may if possible do the field work before Thanksgiving (the twenty-fifth). I should like to be at Northampton then, and then may be for a week after that. I would also beg (if I am not to meet you on the Irving property) that you would send me by mail the photograph maps of tracts in Virginia that I sent you at the time I went, as I am hardly at liberty yet to let them go permanently out of my hands.

Very truly yours.

Benj. Smith Lyman.

[illegible] Street, Philadelphia, 13 Nov. 1878.

Prof. James Hall,
Albany, N.Y.

My dear Sir:

Mr. [illegible] desires me to write you for him, he is so busy, and asks if you have yet so definite appointment to make him for his lectures in the University you spoke of to him; he fears you may have already written about it and that your letter has miscarried.

The big fossil you wrote me about some time ago has probably [illegible] before this; but in case it should not have done so and it is to be secured, I take this opportunity of begging that you will let me know as soon as convenient, so that I may if [illegible] do it yield work before [illegible] [illegible]. I should like to have it [illegible], and [illegible] [illegible] [illegible]. I would also beg (if I am not [illegible] in the big fossil [illegible]) that you would send me by mail the photograph [illegible] of [illegible] in Virginia that I [illegible] at the time I wrote, as I am badly [illegible] yet to let it go permanently out of my hands.

Very truly yours,

Benj. Smith Lyman.

[Rough Draft.]

The bearer of this, Mr. Winfield Scott Caldwell, is now twenty one years old, has been living the last six years on the farm of Mr. Wm. Perrine at Cranberry, New Jersey, and before that was a waiter in this city. Mr. Caldwell's mother has lived for many years in this building, is a very worthy woman and has brought him up to be honest and industrious; and he is very highly spoken of by Mr. Perrine. [illegible] personal acquaintance with Mr. Caldwell has been short, but I have known about him for several years; and I am well satisfied both [illegible] all that I have heard and from his appearance and behavior that he is quite [illegible] and intelligent and would make an excellent waiter, coachman or gardener.

Benj. Smith Lyman.

[illegible] ~~Fifth Street, Philadelphia~~
[illegible] Nov. 18[illegible].

[Rough Draft]

The bearer of this, Mr. Winfield Scott Caldwell, is now twenty one years old, has been living the last six years on the farm of Mr. Wm. Perrine, at Bromberg, Wearfeney, and before that was a resident in this city. Mr. Caldwell [illegible] has lived for many years in this [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible] [illegible] and [illegible]; and he is very highly spoken of by Mr. Perrine [illegible] [illegible] [illegible] with Mr. Caldwell [illegible] [illegible], but I have known [illegible] [illegible] [illegible] [illegible]; and I am well satisfied that [illegible] that I have heard and from his [illegible] and behaviour that he is quite [illegible] and intelligent [illegible] and would make an excellent [illegible], [illegible] or [illegible].

Benj: Smith Lyman.

[illegible]

135 South Fifth Street Philadelphia; 13 Nov. 88.

Dear Cousin:

Your favor of day before yesterday came duly to hand; there seems to have been no danger of its having to travel long over the country to find me. Indeed, all the magnificent projects for a rock in the field seem to have fallen through; at least, one of the smaller ones has certainly done so, and as the road cannot be talked of no longer, they have probably been dropped too. — I should be glad to keep thanksgiving with you, as you ask, and have been hoping to do so; but I am not yet sure that I shall be able to carry out the plan. I shall try, however, to let you know definitely whether I can come or not. — Cousin Eliza seems indeed to have a great variety of abiding places. — You will no doubt have a charming visit from Aunt Jerson and the children, and I am anticipating much pleasure from seeing them here again. — Ever since the beginning of September I have been taking the Springfield Republican, and am therefore somewhat better posted than formerly in the news of the valley and of Northampton generally, and have seen in it already some thing of the proposed railroad. I should think it would benefit Northampton somewhat but am not now competent to form any opinion whether it would do so in a degree equal to the risk of advancing three hundred thousand dollars towards the stock of the road. I should think the road might perhaps pay especially if the ground through Lake to Boston should be built. It seems now almost impossible to get private individuals to subscribe towards building a railroad except certain men who are largely interested in property along the line, and as the community in general gets indirectly as well as directly decided advantages from such roads, it seems fair enough that it should either as towns or counties but more especially as state subscribe towards them. The members of the legislature are perhaps more competent to decide such a matter than the majority of the voters themselves. I did not suppose there was so large a number of Irish voters in Northampton as to have a very great influence upon the decision of such a matter. I see by the paper that Hampshire County was the banner County of Massachusetts in the late election, and that only one man in seven that voted [illegible]

Last Friday I went out to Media with Dr. Elwyn to see the school there for feeble minded children; he is one of the trustees and went then to a meeting of the board and as I happened to call on him the evening before he asked me to go with him. There were some others outside of the board besides myself, and some ladies among the rest. We all looked on at some of the exercises of about eighty of the children, chiefly gymnastic exercises; and they did very well and kept very good time with the music of a piano. The children did not have so disagreeable a look as you might expect, for their expression becomes more intelligent as they become educated a little. Some of the children even looked as bright as children I have seen in common schools. Of those we saw about half were boys and half girls; the whole number in the school is about 160, of whom 80 are state pupils, 12 Philadelphia city pupils, some New Jersey state pupils and some Delaware or Maryland State pupils and some private pupils. When the board went to its meeting we outsiders went to look at the sleeping rooms, hospital room, and school rooms. Every thing looked very clean and smelt clean, but from the number of beds in one room, sometimes even eight in a room of moderate size, it seemed likely that the ventilation could not be very good in general. As visitors were expected that day, things might have been aired well on purpose. But they said that there were very few cases of sickness. They gave us a lunch, and those who went from Philadelphia hurried off to the cars. At the Rail Road Station, however, I parted from the rest in order to see a little of Media and the surrounding country, as I had never been there before and the weather was very fine. The school was a mile or so from the town, a large building in a fine position on a hill with a grand view. The assistants of the school, by the way, were all Massachusetts girls, one of whom from Boston, quite handsome, was married to the principal. Miss Worcester (a Swedenborgian, as she afterwards told Dr. Elwyn) had special charge of me in showing off the school. I strolled about Media for nearly an hour and as I was unwilling to leave the place without entering any house there I [illegible]led at Miss Eastman's famous girls' boarding school, to see if Miss Lucy [illegible] sister to my flame Mary, of Exeter, was not teaching there as I understood she was when I was at Exeter two years ago. To be sure I had [illegible] known her but to slight her, but I thought I might treat her better now. It turned out that a [illegible] of [illegible] had been a teacher there five years ago, but they knew [illegible] since that; so I retreated in discomfiture. I walked back to the city [illegible] twelve miles, of which I walked eleven in two hours and twenty five

135 South Fifth Street, Philadelphia; 17 Nov. 1868.

My dear Keyes:

Your very welcome favor of the twenty seventh of last month is just at hand. I have noticed with interest your advertisement in the Journal of Mining, and have heard in the ways from time to time a word or two about your movements; and am very glad now to have a little fuller account from you. I am glad too to hear that you know something of Steitz's whereabouts, and if you should see anything of him, please remember me to him most kindly. I heard of his being at the Missouri Iron Mountain and afterwards at St Louis, and of his holding a lantern to light up a robber somewhere on the plains while somebody else shot him; but I had no idea that he was now in Montana. It was Crafts that told me about Steitz; he had seen the last incident in a newspaper. Crafts was here last Christmas for a week, then went home to eastern Massachusetts, and soon after took charge of some iron mining and smelting in West Stockbridge, Mass., at the Pomeroy Iron Works; and he is still there. He had been two or three years in the Lake Superior Copper Region after coming back from Freiberg, and [illegible] had made various short journeys in different parts of the country on professional business; and among others to West Virginia winter before last. After that he was very sick for a long time; but last winter was [illegible] as well as ever, though still obliged to be careful. Jackson, at last accounts, was still up in the Lake Superior Region, where he went right after his return from Freiberg. He wrote Coxe a year or [illegible] ago that he had introduced his car into use at the mine [illegible] charge of, and that the miners did not altogether like it. You have probably heard of this car once or twice before. Coxe is managing the mine he opened at Brighton in the anthracite region, on a comparatively small portion of his ancestral acres, and he has been there ever since he came from Europe. A year ago he used to come often to this city but his visits culminated last summer in his marrying an excellent young lady and sick heiress, and he now comes here much seldomer, for she is content to live up at the mines. He is just getting out a translation of Weisbach's great book on Mechanics, with the encouragement and help of Weisbach himself. Coxe has just taken into his [illegible] young Richter who

was a poor boy at the mines in Freiberg in our time, and was then just beginning his studies at the Bergschule. He has been befriended by Americans, of whom Boalt was the first to give him the idea of getting an education; and he has now studied two years at the Academy after finishing the four years course at the Bergschule. He was brought to this country by Dr. Koenig a Freiberg Student who had some knowledge of English and some money, while Richter had precious little of either, and he brought a good letter from Weisbach to Coxe. Koenig is a chemist and metallurgist and is looking forward to a trip to Montana in the spring. He has studied at Heidelberg and Berlin as well as at Freiberg, and is well posted up in his branches. If you happen to know of an opening for him out there, please let me know. — Do you ever hear what Stuven and Herreros are doing? They say Obando has finally left Freiberg.

As for me I have been mainly occupied since coming from Freiberg in the same kind of work as before going [illegible] namely geological and topographical surveying. The fall I came back I made one survey of some size in the anthracite region near Pottsville; the next spring I went for the same work to Cape Breton (Nova Scotia) and staid there until winter; then I was sent out to California from here and after staying there about six weeks came back overland, with ten days at Washoe, a day at Salt Lake City and a few days in Colorado Territory; then I was employed in Cape Breton again until the next winter; then I was occupied with small surveys in Pennsylvania, in the mountains, sometimes in Virginia and other regions, with my head quarters here. For the last year or two business has been very dull in this line, perhaps even more so than in business generally. Indeed this brings me to the answer to your question as to whether your Philadelphians have "learned wisdom yet." They seem to have done so, far enough to steer clear of mining enterprises in general, but more particularly gold and silver ones, at least for the present. Perhaps there will be by and by a new crop of men anxious to try their hand at all kinds of such projects, as happened two or three years ago. They lost so much money then, that they are determined at least to lose no more in the same way now. There are however some people here interested in gold and silver mines; but I know scarcely any of them and am quite unable to say whether there is "any possibility of placing in Philadelphia good paying or well promising mining properties" of Montana. — Rosthwell by the way has been established for a year or [illegible] Wilkesbarre, as you may by his advertisement and is doing a good business, I believe.

I send you a photograph of a little map of mine made lately, of a small tract in Illinois.

Yours truly yours — Benj. Smith Lyman

135 South Fifth Street, Philadelphia; 18 Nov. 1868.

R. W. Raymond Esq.
Editor of the American Journal of Mining,
New York.

My dear Sir:

When my credit with your paper on account of contributions will is exhausted by my advertisement and subscription is next July (on the plan you proposed last winter of reckoning for dollars for each column contributed), please stop the advertisement, so that it may not be running up a debt; and, if convenient send me our account.

I remain, as ever,

Very truly yours.

Benj. Smith Lyman.

On Smoke Burning.

To burn fuel in the most saving way it must be supplied while heated with enough air, but not too much. If there be not enough air, some of the fuel escapes not thoroughly burned, in the form of gas, either carbonic oxide or hydrogen. If there be too much air, it carries off a certain amount of heat uselessly through the chimney.

The air may be supplied either wholly through the grate; or partly through the grate and partly above the solid fuel. The air supplied above the solid fuel serves to burn the part of the fuel that has been turned into a gaseous form. It is just as possible to keep the air at all times rightly proportioned to the amount of solid and gaseous fuel to be burned, whether the air be furnished wholly through the grate or partly above it.

The amount of air supplied through the grate in a given time should be suited to the thickness of the layer of solid fuel and to the size of the lumps, that is, to the surface of the fuel exposed to the action of the air. The thickness of the layer of fuel need not vary very much if the charges are small and frequent; it can be quite uniform only when the charging is continuous, when as much fuel is

Our Friends Discussing.

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"I know what I'm talking about," said Mr. Bangs, with a slight frown. "I've had to do with the matter myself, and I've had to do with it for a long time. I've had to do with it for a long time, and I've had to do with it for a long time. I've had to do with it for a long time, and I've had to do with it for a long time. I've had to do with it for a long time

the are on each instant as is burned up each instant. If the lumps are of various sizes, as in soft coal, there may be some trouble in regulating the draft so as to make the burning perfect; but if the lumps are never very large, those at one time on the grate do not vary much on the whole in size from what are there at another time.

With soft coal the part of the fuel to be burned in the gaseous form is especially large just after the charging; so that more air should be supplied at that time (whether through the grate or above) than should be a little later. But if the charging be in very frequent small quantities or even continuous, the gas will be very uniformly given out and the supply of air may be kept uniform. With common charging, if the lumps of soft coal that have caked together by the heat be broken up from time to time, the gas is also thrown out more uniformly, so as better to suit a uniform supply of air; the size of the lumps is also kept more uniform and the passage of the air less irregularly obstructed.

Opening a door above the solid fuel in charging lessens the draft through the grate, so as to make the fuel burn less thoroughly and give out more of the combustible gases than common; and these

one further added to if soft coal be thrown on at the same time. This fresh fuel likewise cools down the top of the fire and the space above it; and a great draught of cold air passes over the fire at the same moment; wasting the heat and carrying off the gases to cool & burn. Loss from this cause is less with frequent small charges, because there is greater uniformity; and less too if they are thrown on only near the door, so that the gases from the fresh coal pass over the hot fire beyond; and it does not take place at all in continuous charging or when the charging is done without opening a door above the solid fuel.

If the fuel lie very thick upon the grate so as to be far too much for the air let in, the available part of the fuel will be wholly changed to carbonic oxide; and as the mixture of resulting gases will be on the whole uniform in composition, a uniform jet of it from a receiver of considerable size can be burned completely without waste of heat by an easily regulated uniform draft of air.

Benj. Smith Lyman.

335 South Fifth Street, Philadelphia,
19 Nov. 88.

are further added to it, soft coal be thrown on at the same time. This fresh fuel likewise cools downstairs of the fire and the space above it; and a great draft of cold air passes over the fire at the same moment; wasting the heat and carrying off the gases too cool to burn. Loss from this cause is less with frequent small charges, because there is greater uniformity; and less too if they are thrown on only near the door, so that the gases from the fresh coal pass over the hot fire beyond; and it does not take place at all in continuous charging or when the charging is done without opening a door above the solid fuel.

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Benj: Smith Lyman.

Mt Smith Tight Street, Philadelphia;
19 Nov. 1888.

135 South Fifth Street, Philadelphia; 20 Nov. 1868.

Dear Father:

Mary's letter of Wednesday came to hand yesterday, and I am sorry to learn by it that James thinks seriously of not going to Northampton to Thanksgiving, and does not even hold out a prospect of his being there at Christmas. Since I have grown up I have never failed to keep Thanksgiving there when I have been as near as this [illegible], even if I could be there but two days; and I have hoped that this year would not be an exception to the rule. Indeed, I am so near being able to bring it about that it seems worth while on the [illegible] to ask a little help from you towards it. I am in daily expectation of a remittance from Cape Breton on account of the sale of my land which I ordered some little time ago, and an offer had already been made for the lot. If it should come before next Tuesday or Wednesday I should have the boldness to devote a small pound with it to a trip to Northampton, as I have some prospect of having still something else to live on through the winter. But if this Cape Breton money should not come until a few days too late it would be provoking to lose the excursion; and I would therefore be very much obliged to you (if you could find it convenient) if you would send me a draft for fifty dollars. I shall hardly be able at any rate to leave here before Wednesday, as Mr. Hall (Gilbert) writes that he will be here on Tuesday or Wednesday on his way home from Washington and I shall stay until the last minute in hopes of seeing him. He says he will explain about that little job I spoke of as on the Hudson River, but does not say whether it is quite given up or not; most likely, however, it is, and he means to explain why.

About ten days ago came a letter from Mr. Lesquereux that I forgot to mention in writing to Wolcott the other day. After speaking of some geological matters, he says: "If ever you have a short moment of leisure to think of and speak with your old friend of Columbus, please write me and answer in the length of possible the following inquiries: 1st. How are you yourself? have you [illegible]? is your health good and are your prospects the same? 2d. How is your kind father and your whole family? [illegible] you write them please to very kindly recall me to their remembrance and and them my affectionate and respectful regards. 3d. How is our friend Lesley &c. And then at the end: "We did [illegible] possible in our country as you did also in Pennsylvania. May the [illegible] give us that peace promised by [illegible]." Love to all. [illegible]

[illegible]

35 South Fifth Street, Philadelphia. Dec. 4

R. W. Raymond Esq.

Editor of the American Journal of Mining
New York.

My dear Sir:

Many thanks for your kind favor of the nineteenth just at hand.

The Painter Tract Report you are so good as to mention is an old story now and was sent merely as a vehicle (in medical phrase) for the new photograph map of the Barnard tract in Illinois. There were some copies of the Painter tract report on hand without maps; perhaps one with a map was sent to you a good while ago.

To tell the truth I felt rather freed from any "moral claim for an article now and then" by the fact that an expression I had carefully avoided was in the printing inserted in my article on the mining tracts last summer, and no notice was taken of my [illegible] afterwards. You know you expressly make the writer responsible for what appears under his name, and what he writes ought therefore not to be changed. It was not a matter of much consequence however, and if you won't never do so no more I may possibly condescend sometime to boil over (not to say slop over) into your columns.

Very truly yours.

Benj. Smith Lyman.

[illegible]

[illegible]

[illegible]

3813 Ste Fe St Philadelphie, le 3 Novembre, 1886.

Mon cher ami,

J'ai vraiment honte de n'avoir pas plus tôt répondu à votre bonne lettre du [illegible]. Si l'on ne répond pas à une lettre tout de suite, mais la diffère, on trouve toujours de nouvelles raisons pour la différer encore de jour en jour et de mois en mois. — J'ai été bien aise d'entendre de vos nouvelles, votre grande activité dans la géologie, tant en course qu'en la grande exhortation; et j'espère bien que l'on va poursuivre la grande carte géologique pour la France entière. Je voudrais bien avoir cette belle carte du tiers de la France déjà finie. Je lis toujours le Bulletin de la Société géologique, j'y ai trouvé quelquefois intéressant avec plaisir mais il est généralement fort en retard. Je viens de finir la lecture de la livraison qui n'est arrivée également au commencement d'octobre, et contient les communications faites le 2 Mars seulement. J'ai vu avec plaisir dans cette livraison que l'on va recommencer un peu les communications qui étaient trop longues. Il arrive quelquefois que les auteurs ne sont pas assez concis pour profiter; j'aime mieux la nourriture un peu plus concentrée. — Je vous suis très obligé de votre complaisance envers mon ami et parent Mr Howe. Je ne l'ai pas vu depuis son retour en Angleterre (en juillet), mais il m'a écrit plusieurs fois. Il est [illegible] à Boston tout de suite après son [illegible], et là pourquoi il n'est plus tout à fait content, il est trop occupé à [illegible] avec sa "Hurdle" comme on dit dans le Bearn. Cela me rappelle [illegible] ce que vous disiez [illegible] de mariage pour [illegible] des mines dans vous ne m'en avez jamais parlé. L'un [illegible] est marié au mois de juin à une jeune fille de Philadelphie. Elle est d'une bonne famille qui est riche et intelligente, elle est elle-même intelligente et bonne, elle aime l'histoire naturelle et a contribué la connaissance; et elle et son mari demeurent près des mines dans des montagnes. Cope vient ainsi bien moins souvent à la ville et à la société bien souvent. Il va publier prochainement la traduction de l'ouvrage sur les machines de M. le professeur Reuleaux, de Freiberg. Cope est toujours bon garçon malgré qu'il soit marié. Je compte aller [illegible] quelques jours à sa mine et faire la connaissance de sa femme allemande. — Whitfield travaille à Brooklyn, [illegible] de caractère. Lui aussi il est marié comme vous le savez sans doute, depuis quelques années à une femme allemande qu'il a trouvée en France. Elle est jolie, toujours malade et a beaucoup de [illegible] qui sont aussi je crois maladifs, mais je n'ai jamais vu de famille. Il est [illegible] il y a deux mois mais je ne l'ai pas vu

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[illegible] 1858.

[illegible]

[illegible]

A propos du bulletin de la société géologique, n'y aurait-il jamais une livraison pour la réunion extraordinaire de 1865. Aucune ne m'est parvenue et si elle est parue auriez-vous quelque jour la bonté de me la procurer. Celle-là est la seule livraison qui me manque jusqu'à la livraison dernier, et j'ai toutes les autres livraisons de réunions extraordinaires, celle de 1867 y comprise. — Vous ne m'avez rien raconté de vos belles courses géologiques de l'année passée. La Société n'en a pas eu en 1867, mais l'école des mines en a probablement eu. Peut-être vos courses fréquentes pour le grand ont fait sembler comme peu de chose ces grandes courses annuelles! Est-ce que M. de Beaumont fait encore le grand cours de l'école; j'espère bien et qu'il la fera encore bien des années! M. de Chancourtois y est sans doute toujours; et M. Lamé aussi va-t-il avec les autres comme ami des prospecteurs ou non plus professeur lui-même. Je voudrais bien le revoir encore et sa vaillante famille. Ma parler d'un retour quelque jour en Amérique ne peut entre vous avec sa famille [illegible] de sa femme! mais je n'ai pas entendu qu'il fût déjà revenu. Quand il y était, il y a plus de trois ans, j'étais malheureusement au Cap Horn, et je n'ai pas eu la joie de le voir. — Cette année j'ai bien peu de chose à vous raconter en fait de voyages. Mon mariage a été [illegible] a été. Il y a eu bien peu de négoce ces deux années passées, et mon métier a spécialement souffert, parce que l'on ne veut plus prendre de l'argent dans les mines avant après deux années où presque tout le monde a spéculé de l'argent dans des mines de toute sorte et dans les puits à huile de roche. On est maintenant si timide à cet égard qu'on n'ose même pas essayer les meilleures mines. Dans ce moment-ci, cependant, l'exploitation de la houille et de l'anthracite est bien prospère, l'exploitation du fer l'est aussi, et dans le printemps prochain j'espère un meilleur état de choses en général. J'ai resté tranquillement chez moi presque tout le temps, mais l'été passé je suis allé en voyage pendant six semaines, d'abord à mes parents à Northampton et puis à Chicago dans l'Illinois, où j'ai fait visite avec une de mes sœurs et une cousine de Northampton chez deux de nos cousins qui sont mariés là-bas. Pauvres [illegible] pour ne voir ces immenses [illegible] comme cela a été [illegible] Nouvelles! Quelles [illegible] un grand voyage. Nous sommes allés par le Michigan et nous sommes revenus par les grands lacs Michigan, Huron et Erie, et les montagnes de Pennsylvanie.

En espérant bientôt de vos nouvelles, je reste toujours votre ami dévoué et dégoûté.

Henry Smith Carmen

135 South Fifth Street, Philadelphia, 23 Nov. 1868.

Mr. Edward A. Rowe.

Dear Cousin:

Your favor of yesterday is just at hand. I think it pretty certain that I shall go to Northampton this week, probably on Wednesday; but if anything should happen to prevent my doing so I will drop you a line to say so. — The difficulty about getting work as a mining engineer in the Wilkesbarre and Scranton region seems to be that the coal properties there are falling or have fallen into the hands of great transportation companies who have their own engineers to employ. Perhaps my impression in this matter is notably a wrong, but it is founded upon statements made by my acquaintance who settled, as I once told you, as a mining engineer at Wilkesbarre a year or two ago. From what I have heard I should think Pottsville would be the best place if you are bent upon that kind of work; but it seems to be true that the [illegible] [illegible] [illegible] [illegible] [illegible].

I shall [illegible] be back from New England under ten days, if I go there: but I will let you know more precisely when, if you will let me know where to address you a week or so hence. Until the end of this week you might address me, if you please, in the care of my father at Northampton.

Very truly yours,
Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; Nov. 1885.

Mr. W. S. Laird,
Willow Street, above Broad.

Dear Sir:

Please send me half a ton of Lorberry Coal, egg size, as free from slate as possible. If there is no Lorberry to be had, please send the freest burning coal you can. Please send it this afternoon without fail, as I am to leave ~~soon~~ early tomorrow morning; and send the bill receipted.

Yours truly,
Benj Smith Lyman.

[illegible] Street, Philadelphia, [illegible] 1885.

Mr. W. S. Laird,
Hallas Street, above Broad.

Dear Sir:

Please send me half a ton of Lottery Coal, egg size, as per from [illegible]. If there is no Lottery Ste Ind, please send the first [illegible] and you can. Please send it this afternoon without fail, as I am [illegible] early tomorrow morning; and send the bill receipted.

Yours truly,
Benj. [illegible]

135 South 7th St. Philadelphia, 24 Nov. 63

Dear Father:

Your favor of yesterday enclosing a check for fifty dollars is at hand and I am much obliged to you for it. — I shall probably reach Northampton tomorrow evening by the late train.

Love to all.

Your affectionate Son.

Benj. Smith Lyman.

1358 S. M. Fifth Street, Philadelphia; 24 Nov. 1888.

Mr. Richard H. Allen,

My dear Richard;

Your kind favor of yesterday is this morning at hand.

I am sorry to say that I shall not be able to accept your invitation to sleep with you this evening; for there is a prospect of seeing here today a gentleman on his way through the city, whom I wish very much to see. I shall therefore set out tomorrow for Northampton, and if I find there is time I will see you a minute as I pass through New York, at your Country room; but it is quite likely that I may have to hurry up to the New Haven Station right away. In that case I will try to see you on my way back; which may not be for ten days or so, as I wish to [illegible] two or three little visits, if possible.

Affectionately yours,

Benj. Smith Lyman.

135 S. Fifth Street, Philadelphia; 24 Nov. 1883.

Mr. W. S. Laird,

Dear Sir:

As you did not send this afternoon the [illegible] ton of Lorberry (or other free burning) coal, egg size requested in mine of this morning; I beg you will send it tomorrow before noon. My assistant Mr. Platt will be here until that time, you will pay the bill, if you will be so kind as to send it receipted.

Yours truly,

Benj. Smith Lyman.

[illegible] 1855.

[illegible]

My dear [illegible]:

Enclosed I send [illegible] of Lancaster [illegible] which [illegible] I think [illegible] [illegible] [illegible]

135 South Fifth Street, Philadelphia.
10 Dec. 1868.

My dear Cox:

The bearer of this is my particular friend Mr. E. R. Howe of Cambridge, whom I have spoken of to you the last three years as a student at Freiberg and Paris. He is just setting out on a little trip to the Anthracite Region; and should he be able to go to Drifton, I am sure you will find him a very agreeable acquaintance. Any kindness you may be able to show him, such as letting him see your mines or the like, will be reckoned a special favor by

Yours very truly,

Benj. Smith Lyman.

[illegible]
10 Dec, 1888.

My dear Lyon:

The bearer of this is my fac-
[illegible] friend Mr. E. H. Hare of Cambridge,
[illegible] of to you the last three
years as a student at Harvard [illegible]
[illegible] is just getting out on a little
[illegible] to the Continental Region; and should
he be able to go to Bryn Mawr, [illegible]
[illegible] will find him a very agreeable
[illegible]. Any kindness you
may be able to show him, [illegible]
letting him see your [illegible] on the
[illegible], will be reckoned a special favor
by

Yours very truly,
Benj. Smith Lyman.

35 South Fifth Street, Philadelphia, Dec. 1868.

H. Fremont Esq.

Dear Sir:

Your favor of the fourteenth of last month with the enclosure of a private letter and of some extracts for Dawson and myself came to hand through the kindness of Mr. McGuire on Thanksgiving day, at Northampton; from which place I got home last night.

I have not yet seen Dawson's book and am much disappointed from the tenor of the interesting passages you made. It would seem from these passages as if I must have faith in Mr. Moseley's statements and geological skill then in Mr. Linley's or mine, and as I trust more so than Mr. Dawson's conjectures made before the Glace Bay and Cow Bay region were surveyed then & the thoroughly proved results of Mr. Linley and my three seasons work. When Dawson has spent as much time as we have done there with a compass and chain and theodolite it will be no presumption in him to differ from us in regard to the geology of that region; but he will not with it then.

With regard to the map you suggest my making of the Joggins and Minudie coal region, you know that the field work and plotting done there furnished important information in connection with your claims; but that a finished map of it would be of so little comparatively to you that I could hardly recommend your going to the expense of [illegible]

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35 Fifth Street, Philadelphia, Dec. 1[illegible]

J. N. McQueen Esq.,

Sydney, C.B.

My dear Sir:

Your most welcome favor of the sixteenth of last month reached me at Northampton just after the Thanksgiving dinner. You know how much we Yankees make of Thanksgiving. I always go to Northampton at that time when I am as near as this city, even if I have to come away again within a day or two. This time I made a longer visit than usual and got home only night before last. But in the mean time I had made a little visit to my friend and college chum Mr. Seaborn, who lives now [illegible] and is one of the editors of the Springfield Republican, [illegible] and I made also a short visit at my uncle's [illegible] on my way home. Letter writing is apt to be very convenient to me while making such visits, and so I have put off writing you until this time. This, by the way, is my birth [illegible] I am thirty-three years old. I enclose herewith an answer to Brownlow's letters with the tracing that he wished returned; you can read the answer if you like. — I am sorry that Boutilier backed out of his offer for the land, but if Lonergan will after the first of January give $300 in cash for it, so much the better. You have been very faithful and kind in attending to my interests throughout, and I feel very thankful for it. Dr. Estes Howe & Mr. Converse were here three or four weeks ago one Sunday, and they seemed to be very hopeful in regard to the business prospects of the Cape Breton coal mines. If business there should speedily revive, as they expect, it would perhaps raise the value of this land; and if a rail road should ever be built to Sydney or to Louisbourg either a branch or the main line would pass through the lot I think, and it was partly in view of this that I took it up originally. It seems as if such a road must hitherto end be built, although it may be years before it is done. The mistake in the description of the lot in the grant is clearly a clerical one, but I agree with you that it is best to have it set right. Probably the sketch that goes with the description shows what was really meant.

The season with you is I suppose about as far advanced as it is at Northampton. We had had four or five snowstorms before Thanksgiving, most of them quite trifling, and the ground was bare then; but last Saturday some nine or ten inches of snow fell and we had sleighing the next day; and it snowed again on Monday but turned to rain afterwards so as to leave the sleighing poor in the town itself. Sunday Afternoon Henry Hinckley my old schoolmate, now married to another schoolmate and living at her [illegible] house, took my two sisters and me on a long sleighride with his fine pair of horses. He is a very good fellow and the most agreeable by far of my male acquaintances in Northampton. I have probably spoken of him to you before and of my meeting him in Europe, where he spent a couple of years in travelling after graduating at New Haven. His father's name was originally Lyman, but he changed it as a condition of a bequest of his maternal grandfather. That branch of the Lyman family, however, is very distant from ours; for you must know that the Lymans first came to Northampton soon after their first arrival in America and that was in 1631, so there has been time for widely separated branches of the family to spring up. Henry Hinckley's uncles all have got the name of Lyman, but his aunts some of whom were great beauties are all married. The handsomest of all married Senator Foster of Connecticut lately president of the Senate but now no longer [illegible]. A cousin of Henry's named Richard Allen lives in New York and keeps a large store for the sale of agricultural tools in partnership with his father, and in connection with a manufactory in Brooklyn. Richard was also a schoolmate of mine at Northampton and we visit each other sometimes now. He is a bachelor and his mother and father and brother and handsome sister (and the Adelaymate Yvonne) have been traveling in Europe for some time. Yes, the Lyman name must have stood well in respect to beauty when Henry's aunts and mine were young. My aunts Mrs. Delano and Mrs. Lesley were very handsome. Mrs. Delano is now living again with her family at their country seat [illegible] Newburgh on the Hudson River. Mrs. Lesley and her two daughters [illegible] Mr. Lesley here just before Thanksgiving and they boned this winter quite near to me. The two girls have grown famously since I saw them last, [illegible] years ago, and the elder, [illegible], is as tall as a grown woman.

Please give my best regards to your wife and niece and believe me [illegible] very affectionately yours. Benj. Smith [illegible]

35 South Fifth Street, Philadelphia, 12 Dec. 1888.

[illegible] Hand[illegible] Esq.

My dear Sir:

[illegible] power of the fourth did not come [illegible] until [illegible] return here from a journey on last [illegible] night. I [illegible] in seeing Genl. Wister yesterday and said that any day would suit him for the taking of the position, and he would not name any special day. Mr. [illegible] today said the same for himself, and would name [illegible] but said he had an engagement that would [illegible] sometime after the first of January. [illegible] your lawyer should appoint a day as [illegible] may be, and inform both these gentlemen and the [illegible] fit as soon as possible. It [illegible] would [illegible] much more expeditious for the appointment [illegible] made for [illegible] sides by your lawyer here, Mr. Maney, [illegible] is to conduct the examination; [illegible] than to have one [illegible] the lawyer there to [illegible] Maney. So much time is used up in all this [illegible] that the difficulty of arranging the appointment [illegible] increased. Mr. [illegible] if he has authority could arrange the [illegible] ten or two [illegible] in advance and [illegible] by the opposing counsel right away [illegible] made.

Very truly yours. [illegible] Lyman.

I have discovered today such an architectural journal as you inquired for the other day. It is "Howe's Architectural Review & Builders' Journal, an illustrated monthly; conducted by Edwin Howe, Architect, assisted by Chas. J. Lukens, Philadelphia, Chapter, Penn. Yorkshire, 5 19 82, Albert Street. The numbers for March & April are published volume.

135 South Eighth Street, Philadelphia, 14 Dec. 1[illegible]

Dear Mary:

The evening I left Northampton I went straight to Uncle Edward and was pleasantly welcomed by him and his wife although not expected that evening. I arrived there about half [illegible] a little before their tea, which is a light affair and served in the library, now that they dine at five o'clock. The boys Frank and Jo came in from some visit or recitation and staid a few minutes with me before going up stairs to their evening studies. Frank had grown enormously since I had seen him, and Jo too somewhat. They said there was some possibility of their making an excursion to Northampton in their [illegible] holidays; perhaps only a special invitation was lacking to decide the point entirely. Uncle Edward and his wife had to leave me that evening to go to a party, but would have taken me with them if I had been so inclined and had had [illegible] needful wing with me. They left me provided with great numbers of large European photographs to look at, and these made the time slip away until it was half past eleven, and the party goes come home as I was getting to bed. After breakfast the next morning I was entertained most agreeably with more photographs and with pictures of objects in the Neapolitan museums, while the different members

of the family went about their various avocations. Aunt Kate (or Kate, I can't remember which it is agreed to call her) had to go to the meeting of a needlewomen's friends society; Jo had to study up stairs and in the middle of the morning to go to the Gymnasium with some of his Dow Cousins who study also with a private tutor. To show off the large photographs, particularly some night views, they have a machine called a megaletoscope (which by diligent examination of my Greek dictionary would seem to mean great reality shower), & it is placed by the large window in the dining room. I stood until after lunch which happened about one o'clock, as I could not be very sure of finding business men at their offices until near that time. I saw Richard Allen and Mr. Delano and came to Philadelphia in the four o'clock train. Mr. Delano seemed very well and said all his family were in usual health, and that if it were near the end of the week he would like to take me up to Algonac to spend Sunday and see them. But my valise was probably already in Philadelphia by that time, as I had checked it through from Springfield. By the way, I was very much vexed to remember before I got to New York to see that I had quite forgotten to speak again about taking that maple syrup to Brooklyn; for it might just as well as not have been wrapped up in one of the bulbs I carried in my hands, and I should have been very glad to carry it. I had trusted to somebody else's speaking of it, and my own mind was so taken up with such a vast number of immensely weighty affairs as to forget this one.

The ladies here seem all to be in usual health except Mary who is sick abed with a "Catarrhal fever", but is I believe doing better now than two or three days ago. The Miss Tyrrans are thriving well in all respects, and are debating whether to go to New York or elsewhere for their Christmas holidays, which begin next Friday, or to be less extravagant. They celebrated my birthday for me unawares last Friday evening, when I was there with wine and olives and sweet crackers, but I forgot to mention the importance of the occasion until it was too late for them to toast it. Specially.

Give my love to all. Your affectionate Brother
Benj. Lyman.

35 South Fifth Street, Philadelphia; 14 Dec 1868.

Mr. Mac Sanborn:

This will reach you probably to morrow on your birthday. Accept a thousand congratulations and wishes for many happy returns of the day.

On my return to Northampton, the day we parted, I found Uncle Edward had not yet arrived there but was soon expected and he came sure enough that evening. He came down to New York the next afternoon according to previous plan but I concluded to stay over until Monday, to avoid the necessity of spending Sunday in New York. Also I found that Mr. Warren Delano, whom I had hoped to see in New York and who had sent me a message of like tenor by Uncle Edward, was in New York only from Monday night until Friday and the rest of the week at Algonquin near Newburgh. Sunday morning I had a chance to take some exercise in snow shoveling and that afternoon Henry Hinckley took my sisters and me a long sleigh ride. Monday the weather was threatening and snowy enough to serve me as an example pretext for staying another day at Northampton; but Tuesday there seemed to be no reason for not going, and go I did. I was not at all disconcerted at finding as I went southward that the snow was less and less so as scarcely to be seen this side of New Haven, and the storm of the day before had evidently been a rain storm. I spent the night at my Uncle Edward's in Brooklyn, the first time I had ever slept in his house; and was much entertained with a great number of large photographs he had lately brought home from Europe. He married, you know, a second wife some three years ago, a very pleasing lady, and they and the children have lately come home from a year of travelling in Europe. The elder son, Jo, is to enter Harvard College next Summer. He is a very good fellow, and will be well fitted, and will be then seventeen years old or so. He graduated well at the Brooklyn Polytechnic School a year or more ago. On Wednesday after lunch I visited two or three business

[illegible] in New York and took the five o'clock train to this city. My arrival here was just a fortnight from the day I set out, which in spite of my apparent delays corresponded well with my predictions of ten days or a fortnight's absence; for I had thought of coming back by way of Albany and of visiting Crafts at West Stockbridge on the way, and also my Stockbridge relatives; but I had learned by a letter at Springfield that nothing was to be gained by going to Albany. My return therefore was so punctual I found the city illuminated as usual on the occasion and a grand dinner waiting for me at the best down town restaurant. The public had also taken care that I should not be worried and worn out with irksome business immediately on my arrival and it is still considerately leaving me some leisure.

The Weekly Republican came Saturday and was thoroughly perused that evening, except perhaps some of the political articles. Among them, however, I read one on Woman's Rights which just touched upon one point that had occurred to me and does not seem to be [illegible] very often. It has struck me that women were shut out from voting in the first place perhaps because fighting was the main business of the nations or tribes, and it seemed only fair that those who did the fighting should decide whether it should be done. Those who had to furnish the military service might not have liked to have this duty forced upon them by women who would not share its trouble. Wars are not yet altogether past, but have become a very subordinate feature of republican governments and are perhaps even more disliked by educated women than by the men. But such ignorant women as are common in the South would perhaps by their recklessness have been even quicker than the men to begin the war, if they could have done so by voting. Of course this [illegible] recklessness and impulsiveness would be somewhat lessened if women were drawing themselves with political cares and were trained more like men. —The last [illegible] to copy over some columns from it.

It has been quite cold here for some days perhaps even as cold as fifteen degrees above zero, but the ground is still quite bare of snow. —Give my love to all.

Very affectionately yours. Benj. Smith Lyman.

Could you send me a spare copy of the Weekly Republican for Saturday before Thanksgiving, with which the writer is interested in [illegible] My copy was lost and lost.

To the Morning Post.

Dear Sir:

You have been misinformed about the action of the Franklin Institute last night. It did not adopt resolutions condemning international copyrights, but merely declared some resolutions in their favor to be out of order, as not coming within the general aim of the society as a scientific body; although they might be of interest to the members as scientific men or book writers, printers or readers, just as the tariff or the government finances might be.

The merits of international copyrighting were not at all decided upon by the Institute nor even discussed, except that they were very positively asserted by the proposer of the resolutions; and your views seem to agree with his, for you say "the question does not require a single argument." But one member of the Institute and constant reader of your paper would like to know what the essential difference is between a copyright and a patent right; and whether both are not, instead of natural rights, rather mere privileges granted by the government to encourage authors and inventors to make their productions public; whether the very temporariness of these privileges does not go to show that they are not natural rights; whether the copyright did not long go explicitly by the name of privilege ("cum privilegio"); whether it is not therefore a mere matter of expediency if native or foreign authors or inventors be encouraged or not by special privileges; and whether it is expedient to tax all readers of foreign books for the still further encouragement of foreign writing. Are not the inducements for publishing, both at home and abroad, very large already; so that, for example, the American authors you mention have no right to feel "victimized" because Germany and England never offered them the special privileges held out to them by our own government? Has the lack of such privileges on the part of these writers probably deprived the world of a single line of their excellent literature, or lessened its excellence in the least?

17 Dec. 1868. L.

[Real name and address, not for publication:
Benj: Smith Lyman
No. 135 South Fifth Street, Philadelphia.]

To the Morning Post.

Dear Sir:

We have been misinformed about the action of the Franklin Institute last night. It did not adopt resolutions condemning international copyrights, but merely declared some resolutions in their form to be out of order, as not coming within the general aim of the society as a scientific body; although they might be of interest to the members as scientific men, or book writers, printers or readers, just as the tariff or the government finances might be.

The merits of international copyrights were not at all decided upon by the Institute nor even discussed, except that they were very positively asserted by the proposer of the resolutions; and your views seem to agree with his, for you say "the question does not require a single argument." But one member of the Institute and constant reader of your paper would like to know what the essential difference is between a copyright and a patent right; and whether both are not, instead of natural rights, rather mere privileges granted by the government to encourage authors and inventors to make their production public; whether the very long prorogations of these privileges does not go to show that they are not natural rights; whether the copyright did not long go explicitly by the name of privilege ("cum privilegio"); whether it is not thus a mere [illegible] of expediency of native or foreign authors or inventors be encouraged or not by special privileges; and whether it is expedient to keep all readers of foreign books for the still further encouragement of foreign writing. Are not the inducements for publishing, both at home and abroad, very large already; so that, for example, the American authors you mention have no right to feel "[illegible]" because Germany and England never offered them the special privileges held out to them by our own government? Has the lack of such privileges on the part of their writers probably deprived the world of a single line of their excellent literature, or lessened its excellence in the least?

L.

17 Dec. 1888. [Had many [illegible], not for publication:
Copy: [illegible]
[illegible]]

135 South Fifth Street, Philadelphia: 16 Dec. 1858.

My dear Fanny:

Your highly acceptable favor of last Sunday did not come to hand until today as it was not mailed until yesterday. It was looked for yesterday [illegible] but it was concluded that the writing of it had been put off until Sunday evening [illegible] had been prevented then by some Sunday evening caller. — So that Dietrich bab[illegible] dead, and those girls really did get home some now that night. — Your account of the reading club is quite interesting. I hope the reading of Julius [illegible] will [illegible] more successful than you fear! The Molière club is a capital idea and must turn out well. Probably the number of members will be smaller than in the Shakespeare Club; and yet they must be on such terms with each other as to make it a nice cosy affair. The reading of Molière's plays will recall to Henry the fine acting of them that he used to see now and then at Paris, and that will be agreeable if he should [illegible] worried sometimes by a contrast between the two. — You seem to have fairly launched upon the sea of hospitality as far as entertaining [illegible] and dinner [illegible] is concerned. Folks will be sorry to see you hatting up house. — How delighted I should be to wait upon you to the ball on Friday evening: there would certainly be one lady who would not fail to come down from the gallery and dance for lack of [illegible]. I might yet run from here to the [illegible]; but should hardly feel able to do it unless summoned by telegraph, and then could not arrive until late. We didn't after all have a great deal of stripping on the light fantastic while I was at Northampton in spite of the free field: you too little, alas! considering how long it has to last for me. — You have probably had a snow storm today or this evening, something to give George Joy a job of shovelling; for it began snowing here this morning and has rained all the rest of the day as it did before when it snowed with you. I am sorry he has had the chance to cut me out in that line. — The storm has not prevented me from going to the Franklin Institute monthly meeting, nearby, this evening. Mr. Robert Briggs a Yankee here and a friend of the Lesleys and mine [illegible] forward a resolution in regard to International Copyright like the one that was passed last summer at [illegible]; but although

meeting was a small one there were not wanting members to oppose resolution. It was opposed merely as out of order in this society as it [illegible] have been in the [illegible] Chicago. [illegible] meeting [illegible] affair did not go so far as to a discussion of its merits, except that Mr. [illegible] very positively and dogmatically made some assertions in regard [illegible]. He as well as others seems to take it for granted that a man has naturally a right to an idea either of an invention or of a writing [illegible] he has given it [illegible] public, whereas the copyright of books and patent right of inventions are merely privileges granted to [illegible] and [illegible] to encourage their labors and the publication of their results. It may be expedient [illegible] us to encourage even foreign inventors by such privileges, because [illegible] might otherwise keep useful inventions secret from us. But there seems [illegible] expediency on the whole in granting such privileges to foreign [illegible], and justice does not seem by any means to require our [illegible] so. There seems to be no more propriety in springing such [illegible] suddenly upon purely scientific meetings than there would [illegible] bringing up resolutions in regard to the tariff, finance, suffrage or other [illegible] in which scientific men are quite as much interested as in copyrights.

17 Dec. 1861. After the foregoing burst of indignation what could I do better [illegible] rather to bed forthwith. This morning I have still further relieved my mind by a Note to the Morning Post my favorite little newspaper, [illegible] had a short editorial on the incorrectly [illegible] action of the Institute, taking side for international copyrighting as positively and unreasoningly as Mr. Briggs did. If my note should be [illegible] which is hardly likely, as it is so opposed to the views of the paper, I will send you a copy. It has served at any rate to let off steam and as a little exercise in English composition, and may impress the editor privately that there is a word or two to say on the other side too.

Your reading of Hillard's Italy will perhaps be a good preparation not only for living in his house but also for looking at Uncle Edward's collection of Italian photographs. He has a great number of them, and it will take you a long time to look through them all. I wish you had been there to look over them with me the other day. They brought them too a couple of pretty pieces of statuary, in one of which a certain likeness [illegible] was discovered by one of the Lows, and it is perceptible; it is a bust of Pharaoh's daughter. The other piece is the Lady of the Lake. There is a portrait too of Annie, which is a very pretty picture. I hope you will see [illegible] and [illegible] at Northampton in the Christmas holidays; for [illegible] meditating a visit there.

3

Not long after I parted from you I fell in with the writer of that letter I read to you the other day. He rather took me to task for reading it to anybody but yourself and for not particularly pointing out, as he had expressly requested, a hint in it that you might lead him into trouble before you knew it; but what would that be to you? I convinced him that I had done quite right under the circumstances, but he bored me a good deal. He is on the whole a most amusing character to me, to say the least, and I have a good deal to tell about him; but, not to bore you, will give only one little joke. He said he had a great mind to write a play with the title: "Fan the Flame" (like Brougham's titles: "Playing with Fire," and: "Flies in the Web"); but I told him to beware of both fan and flame, and whatever he did himself, not to get me into a watch along with him, if he could help it.

Give my love to Hannah and my thanks for her postscript to your letter. As you did not tell me the length of your writing periods for the next three months, I shall be kept in suspense for the until your answer comes, doubting whether it is delayed by the length of those periods or by the miscarriage of this in the mails. In the meantime, believe me ever

Your affectionate Cousin,

Benj. Smith Lyman.

P.S.—Evening.— I have been at the Lesleys' this evening. Mr. Lesley was reading aloud from Nicholas Nickleby, about the Cheerybles. They were all in the front room where Mary has been lying sick for some days. She is better now, however, and is expected to be up again tomorrow. Meggy had just got a newfangled dolls head that has brilliant blue eyes and shuts them when laid down. The effect is very comical; but it is produced very simply. The lids are painted on the eye ball above the eye itself, and a weight inside the head at the end of a short lever makes the eyeballs revolve when the head is laid flat, in such a way as to bring the eyelids, instead of the eyes, behind the eye openings.— A Naturalist, by the way, was sent to you last Saturday. There are one or two things in it this time that I think will be interesting to you.

B.S.L.

To the Editor of the Morning Post.

Sir:

As you do not seem anxious to prove yourself ready at answering copyright questions, you will perhaps let the questioner himself try his hand at it. It may well be for several reasons very expedient to encourage foreign writers as well as native by offering them copyrights. It is the best writers or at least the most read that profit most by a copyright, so that it may be looked upon as a reward of merit which generosity should give to foreigners and natives alike; for all good literature should be encouraged by everybody everywhere. This seems more easily and fairly done by the copyright, that is by a kind of tax upon the readers, than it could be done by royal gifts and pensions. An international copyright, while encouraging foreign writers, would also ~~be an~~ encourage ~~[illegible]~~ native writers (aside from giving them privileges abroad) by raising the price here of foreign books of each class and so making the corresponding class of home books relatively cheaper and more sought after than now. Publishers of reprints would perhaps be benefitted also by copyright, as it would shut out competition; and of course an international copyright law could not apply to books already given to the world, but only to those written hereafter, so that present undertakings would be undisturbed. Although our present writers would probably have written no more nor better if they had had greater [illegible], yet greater rewards for writing might have drawn able men from other occupations into this (if that were on the [illegible] desirable); and so have added to the world's best literature and perhaps raised the standard of good writing to the benefit of readers as well as writers. But there can be no doubt that the whole question is one of expediency and perhaps generosity, but not at all of mere justice. What is often said of a "man's right to his ideas just as to any other property after they have been given unasked to the public, seems absurd; and calling readers and republishers of reprints thieves and pirates sounds like mere bosh. Whether the copyright question is a fit subject for the consideration of scientific societies not devoted to political economy or social science is at least questionable.

20 Dec. 1852

[Any part of this is at your service for publication; but you would [illegible] by not mangling it if you should choose to print it. Respectfully, Benj. Smith Lyman, 135 S. 5th St. Philada.]

L.

135 South Fifth Street, Philadelphia; 23 Dec. 1868.

My dear Sanborn:

A copy of the Semi Weekly Republican for the fourteenth of last month came to hand the other day and I return herewith ten cents of conscience money to the treasury of the Republican besides my thanks for your trouble. It proved however to be the wrong paper to complete my set and to give me Lowell's essay on Emerson; for what was wanted was the Weekly paper of Saturday the twenty first of [illegible], but very likely no spare copies of that were to be had any longer; and I feel just as much obliged to you as if there had been.

I sent you the other day a little effusion of mine in the Morning Post here, on International Copyrighting; and send you today the afterclap of the same, also by myself. Resolutions in favor of international Copyrights were also brought up at Chicago at the Scientific meeting last summer, and I took pains that they should not pass unanimously as other resolutions were doing at that time, and voted against it alone, loud enough to be heard distinctly; but there was no discussion of the matter before the vote. Those resolutions too talked about the right a man has to his [illegible] as much as to any property, even after publication, and so on.

I trust you will not imagine that my views on the Copyright are influenced by selfish considerations, when I state that I am writing a book that will no doubt be the best of its subject of any in the English language. It is a treatise on Surveying in all its branches, land, railroad, canal, water, mine, geological & geodesical surveying, and is going to be just about the completest thing in the world. The writer of the best American book (if not to best in English) on Surveying is dead, and so he can't interfere and his book only treats of land surveying; and mine is far to excel his even in that branch. It is a big job, but it is underway and although it may be interrupted by work that will pay more readily, yet I shall get through with it in the course of time.

Wishing you all a Merry Christmas and a Happy New Year, I am as ever

Very affectionately yours.

Benj. Smith Lyman.

You must feel quite [illegible] up with the Hubbard President for a next door neighbor. Give my [illegible] [illegible], when he inquires [illegible]

[illegible]

135 South Fifth Street, Philadelphia; 24 Dec. 1868.

Dear Mary:

Your flower of yesterday is at hand this afternoon. Your account of the reading clubs is interesting, and I am glad to hear that Julius Cæsar went off so well, and especially that Henry Hinckley proves to be so good a reader. I should like to have [illegible] in shaking my [illegible] over Hannah and Fanny's carpet at the end of the reading. The [illegible] club must prove to be a still more [illegible] [illegible] than the [illegible] Club. What you say of Miss de Gothal does not surprise me, for if she had been very well educated except in music and some such accomplishments she would be a rare bird among Frenchwomen; but, as you say, she may talk [illegible] very satisfactorily, and it is something at any rate to [illegible] to [illegible] when she is talking at ordinary speed. I think I see the Unitarian church lighted up by gas this afternoon; I am afraid the gas will not make much impression on the ample daylight that will come through the blinds. — [illegible] you say about the snow is rather [illegible] although it is cold enough today. [illegible] was just whitened [illegible]; something as old [illegible] Sales's head used to be at Cambridge.

I send you with this a couple of little pieces that I wrote for the Morning Post newspaper here, together with the little editorial on international copyrighting that called them [illegible]: for my solitary vote on that subject last summer at Chicago may have raised some curiosity in you and Fanny as to my views on that matter. It seems to me that there is a great deal of nonsense uttered on the thing, and it was a little relief to me to have my say; I feel now as if I should not burst the boiler from that cause. — I expect soon to have a personal interest in international copyrighting, for you must know I am writing a book that is to be the standard work on its subject in America if not in the British Empire! At any rate I have a good deal of confidence that I can make a better book than the one that is now the best American (if not English) book on the subject. The book is on surveying in all its branches, land and water, railroad, canal [illegible] mine, geological and geodesical. The [illegible]

[illegible] on surveying [illegible] and it is confined to [illegible] land surveying, and I [illegible] do better than he [illegible] all these branches are so closely connected that they ought [illegible] treated in one book. [illegible] is now dead, so that he can [illegible] improve his book now. Mr. [illegible] encourages my project [illegible] highly, and Mr. Trautwine [illegible] well of it too, and Mr. Bliss [illegible] it might be a very good idea [illegible] made it occur to me was [illegible] arrangement [illegible] subject that I had been making in preparation for [illegible] student, and this arrangement serves as a [illegible] of the table of contents of the book. It is a big undertaking and will take a good deal of time even if not interrupted by work that will pay more quickly or better. But it is a very interesting and absorbing piece of work, and when it is done will advertise me well, and I must bring me in some money directly as well as indirectly. On this score I feel more confident than I perhaps [illegible]; but the dearth of anything good books on the subject and the great number of surveyors of all kinds and the [illegible] of the subject in such new countries as [illegible] believe that a good book will sell. My copy of Gillespie is of the eighth edition and was published only eight years after the first edition. I have had some experience in surveying and in [illegible] ways, such as few geologists pay much attention to surveying [illegible] are few who could put the geological part into this book; [illegible] very important; and those few are probably none of them so situated or disposed as to write the book; so I expect [illegible] competition on the whole from any new writer.

Jos. Lole, and his wife seem [illegible] to have pity in my lonely state, and have very kind made arrangements for my dining with them to [illegible] the night there. I do not feel so lonely, however, and have [illegible] had Thanksgiving that I should not feel uncomfortable at dining alone on Christmas. — Aunt Susan and her family are now [illegible], although both children have just been sick with colds, Maggy last and slightly. — Miss Kate Howard is to spend two weeks here, a [illegible] only from his office, [illegible] Walnut Street, beginning today. — I saw the Hoppers last Monday evening, the first time since coming home. Miss Maria, it seems, has gone suddenly to England with some of the Davies and has been gone more than three weeks. — The Miss Lyonnais were to set out yesterday for New York to spend the Holidays; but have [illegible] such travelers that they would not let me [illegible] off. Give my love to all.

Yours affectionate Brother,
[illegible]

A Merry Christmas to you all.

135 South Fifth Street, Philadelphia; 27 Dec. 1868.

Dear [illegible]:

Your welcome letter of Christmas day is today at hand. If you will not take any peremptory offence at my [illegible] I will [illegible] to be frank. Will it be permitted to bring to your notice a new [illegible] recently coined, [illegible] for "ill, frosted, freeze and many other and for better [illegible] "prepaid" with envelopes "prepaid". Your welcome [illegible] to me and [illegible] for [illegible] [illegible] [illegible]

Last evening Mr. Mitchell & Miss Kate Hamil, [illegible]
[illegible] I [illegible] spare an half an hour
the second we will not count upon pleasure to be
had in [illegible]. She was as lively and agreeable
as ever — I have not been much visiting since Thanksgiving.
I went to the Opera evening to see the Huguenots; it seems
Mr. Mitchell intended to return very soon to England and
quite suddenly and not to pay his visit here. I [illegible]
would not to go to Cuba in the [illegible] and then
[illegible] and [illegible] very pleasant with
[illegible] [illegible] [illegible] [illegible] going
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

135 South Fifth Street, Philadelphia; 29 Dec. 1855.

Warren Delano Esq.

No. 55 Broadway, New York.

My dear Sir:

At the earliest opportunity, within a day or two after getting home, I unfolded to Joseph Lesley the railroad matter you [illegible] the [illegible] day in New York; and he said he should mention it to the higher officers of the Company, and let me know [illegible]. The day after Christmas he said he had not [illegible] good chance to do so, owing partly to Mr. Scott's [illegible] [illegible] a good deal; [illegible] he should not forget [illegible]. As soon as there is anything definite to say [illegible] [illegible] [illegible] to [illegible].

[illegible] [illegible] and the children, and heartily [illegible] [illegible] to you all. I am as ever

Affectionately yours,

[illegible] Smith Lyman.

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135 South Fifth Street, Philadelphia, 31 Dec. 1863.

Dear Father:

None of my schemes for making money seem to have come to a head yet; so I am brought down to asking you again for the [illegible] some more money. I much prefer taking it in the foreign loan in small sums (if I must take it from you at all) to taking the offered bonds [illegible]; and these might serve as security for you if you have to borrow the money yourself. I [illegible] the [illegible] [illegible] the other way [illegible]. If you could send me a hundred and fifty dollars this time, you would oblige [illegible]; but a hundred would do for the [illegible] [illegible].

I have to thank you for sending the copy of the Tribune the other day.

Maggy Lady is still not quite well and was on the bed last evening; [illegible] was reported as quite well again, though they both [illegible] after [illegible] getting better [illegible] Christmas day in bed. [illegible] and [illegible] [illegible] to be very well; he [illegible] well for him. Josiah Whitney made him a call yesterday. [illegible] of the Calif. [illegible] report is printing here [illegible] two [illegible] others in New York and Boston.

Give my love [illegible].

Your affectionate Son,

[illegible] Lyman.

135 South Fifth Street, Philadelphia; 2 Jan. 1869.

Dear Walter:

Your favor of the day before yesterday came to hand yesterday. You need not feel the least alarmed about my starving to death with my present diet. I hardly know whether your fears are raised by my eating at Northampton like a half-furnished man or by my eating so little even there. At any rate until my weight begins to show some marked change for the less, and my appearance begins to seem emaciated, and my hunger begins to be great, it seems fair to suppose that the amount of my food is on the whole satisfactory. I can assure you too that I have in former times got along quite tolerably with far less food than I now eat habitually, and that I found no difficulty in perceiving when the amount of food was too little in amount, or too little in nourishing power, or too unsatisfactory in wholesomeness. The effects in this case were manifest within a week at the very farthest; so there is no likelihood that I am doing myself harm without knowing it by a diet that has seemed satisfactory for nearly four years. As for the amount of food, very much depends upon habit no doubt and something perhaps upon constitution or health or capacity for digesting well. My opinion has [illegible] [illegible] that the degree to which people generally overeat is often exaggerated by many people; and that most men really need to eat much more than would theoretically be [illegible]

Dear Father:

Your favor of the first although unfranked
came duly to hand for which
and was well received with the last
[illegible]
[illegible]
[illegible]

I believe myself commencing my work in the highland circuit
this evening and perhaps some other papers, and I intend to visit
Hamilton first if I could do no more, and I would advise
Cattin the same. Oh. If ever any of it would look to that
district can only be done from Hamilton; since it is there, whether
Cattin or Cattin, for the number of men who may be employed
be as well supplied as may, for it is not very large, and the
number of the ships are at Hamilton for it is still smaller, and so
are the soldiers. I am very busy for we have work
with the coming of spring mine will very soon arrive in
Hamilton I am already [illegible] to the [illegible]
with the [illegible] [illegible] [illegible] by the
in the by anybody else. The commencement finds some
others will be on the work and for the work, and perhaps
sending [illegible] and [illegible] for others as soon as if ever we
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] Fifth Street Philadelphia [illegible]

[illegible]:

[illegible] have given me an M. D. [illegible] and
[illegible] may be useful and entertaining to [illegible]
I will [illegible] get in [illegible] with [illegible]
[illegible] and [illegible] [illegible]
[illegible] [illegible]
[illegible] I am also indebted [illegible]
a Dr. [illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[

[illegible] South Fifth Street, Philadelphia, [illegible] January [illegible]

Leo Lesquereux Esq.

My dear Sir:

A Happy New Year to you and [illegible] and many happy returns of the same. [illegible] I have not heard any thing from you even indirectly [illegible] since I [illegible] you are getting on well and [illegible] have long since [illegible] restored to health.

[illegible] I went to [illegible] to spend Thanksgiving, and had a very pleasant visit there, as we [illegible] in Springfield, where my college friend [illegible] Mr. Sanborn has within a few months become [illegible] of the Springfield Republican. I also had a [illegible] visit on my way home at [illegible] the home [illegible] who live in the summer at [illegible] with [illegible] lately [illegible] travel [illegible] business still continues [illegible] [illegible] in the [illegible]. I am busying myself with [illegible] a [illegible] surveying in all its branches, [illegible] for roads, canals and [illegible] engineering [illegible] and [illegible] surveying [illegible] [illegible] [illegible] well, [illegible]

The [illegible] are all well

135 Lincoln Square, Philadelphia, Nov. 18,

M. Felix Rocca
grand H. Hotel, Paris.

Dear Sir

Your very welcome favor of the twelfth
came duly to hand; and I am delighted to learn by it that
you are to be here again as soon as
convenient from this time after your passage is taken
that time you are coming in and when, so that I may
with certainty fix the time in which all my engagements
can be completed, will you please to name this to me
as soon as possible, as I would wish to arrange my affairs
accordingly, but there
are many things to be attended to, before I can
finally leave.

I shall have to see you again about the
claims of different parts of the United States. We agreed
upon a certain point to meet agreeable to Exchange Alley
Lombard Street, and I hope there may be able to be there
on the
[illegible]
[illegible]
[illegible]

135 South Fifth Street, Philadelphia, 5 Jan. 18[illegible]

Dear Father:

Your favor of the fourth (yesterday) is today at hand, with its enclosure of a draft for fifty dollars; and I thank you very much for the same.

You allude in to a heavy storm (which of course was the cause of the delay of your letter of the 1st received yesterday) in the middle [illegible] for [illegible] we had but enough [illegible] the ground and now that is all gone. But it has been very wet here for several days with [illegible] and rain. Though there has been no heavy rain. It has not been cold and is now still milder; and instead of [illegible] had but few days (say half a dozen in two spells) of very cold winter weather. It was called so here but the thermometer was only at [illegible] at coldest while with you it was perhaps [illegible] below.

Edward Howe is still here, and has not yet found any situation for work, and thinks of going back to Cambridge for the winter. The [illegible] will not, and the children have perhaps got acclimated again; but the damp weather has made colds very common here it is said. Perhaps if people would [illegible] days open and eat only vegetables they would do better.

Give my love to all. [illegible]

[illegible]

[illegible]

[illegible] kind and welcome [illegible] kind [illegible]
[illegible] I could [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible]

135 South Fifth Street, Philadelphia; 6 Jan. 1869.

Mr. [illegible] Esq.

Sydney, Cape Breton.

Dear Sir:-

Your favor of the twenty fourth of last month is at hand. If you have a friend who wishes to advance the money needful for taking out rights [illegible] on my advice, let him make a business arrangement directly with me for that advice, instead of getting it from me through you. If he wishes besides for any influence you may have with the government [illegible] for that purpose an interest in the [illegible].

You seem to feel that you have never had the full [illegible] and Sydney road survey; but you must [illegible] the important [illegible] had upon [illegible] they also enabled me to give you [illegible] in regard to the value of several claims; [illegible] which you said then that you had [illegible] so [illegible] survey extended in reality over a much wider [illegible] appeared in the printed maps and reports. I [illegible] willing to make a map covering [illegible] so far as surveyed; but could not [illegible] the needful for [illegible] expense for that.

Yours truly,

Benj. Smith Lyman.

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135 South Fifth Street, Philadelphia, [illegible]

Mr. W. S. Laird,

Coal Dealer, Willow St. above Broad.

Sir: Please send me half a ton of Lehigh Coal, egg size, or such coal as you sent [illegible] weeks ago; and please have it here either this afternoon before [illegible] o'clock, or as early as may be [illegible] [illegible] half past nine; and send the bill receipted, and [illegible]

[illegible] Lyman.

13th [illegible] Philadelphia, 8 Jan. 87.

[illegible] R. Haven Esq.

[illegible] [See next Page for letter copy.]

Dear Edward:

I have [illegible] Mr. Trautwine this evening, and he thinks it would be a good plan for you to translate [illegible] proposed. He [illegible] does not think [illegible] at all [illegible] his part he would [illegible] hand [illegible] copy of it; and he thinks [illegible] that it would sell. His [illegible] different plan, is meant to be more thoroughly [illegible] but little in formulas, and especially avoids the [illegible] symbols; and it will be in two volumes of five or [illegible] pages each. He thinks it [illegible] the wants of [illegible] from what Weisbach's book [illegible] and more exclusively practical [illegible]; and [illegible] will give value to [illegible] translation [illegible].

[illegible] extract from Mr. Lesley's [illegible] giving the section [illegible] drawing of this [illegible] 500, or about [illegible] inch, at first, and [illegible] good practice for you [illegible] for reference, [illegible] as possible [illegible] making complete [illegible] of all the [illegible] buildings, of every kind [illegible] neighborhood [illegible] answer promptly whenever you [illegible] for you [illegible] for such plans of your own [illegible] for you [illegible]

[illegible]

135 North Fifth Street, Philadelphia, 8 [illegible]

Edward R. Howe Esq.

Pomeroy, O.

Dear Edward,

I have seen Mr. Trautwine this evening, and he says it would be a good plan for you to translate Weisbach's Ingenieur [illegible]. He says he does not think it would conflict at all with his project, and for his part he would like to see the book translated and to have a copy of it; and he thinks there would be many others to buy it, so that it would sell. His own book covers other ground, or is on a different plan, is meant to be more thoroughly practical, deals but little in formulas, and especially avoids the use of algebraic symbols; and it will be in two volumes of five or six hundred pages each. He thinks it would meet the wants of another class of men from what Weisbach's book would, a more ignorant and more exclusively practical class; and the weight of Weisbach's authority would give value to a translation of his work.

I send you herewith a copy of some extracts from Mr. Lesley's coal manual giving the [illegible] of the coal measures in your neighborhood. I would urgently recommend to you to make a drawing of this section; on a scale say of $\frac{1}{500}$ or about forty feet to the inch at first and afterwards on a reduced scale perhaps. It will be good practice for you and be useful too for reference besides making you familiar with the section. I would also recommend that you busy yourself as much as possible in the absence of paying work with making complete working drawings of all the mining apparatus and buildings, of every kind, in your neighborhood. It will enable you to answer promptly whenever you may be called on for [illegible] or any such work; of course for such plans of your own you can make [illegible] movements, more or less upon the [illegible] work [illegible] in [illegible] about you [illegible] [illegible] You can have your translation [illegible] [illegible] [illegible] this other work. There is no need [illegible] [illegible] [illegible]

[illegible]

135 South Fifth Street, Philadelphia; 5 Jan. 1867.

[illegible]

Your very welcome favor of day before [illegible] to hand and I have also to thank you very [illegible] for [illegible] the [illegible] which arrived a few days ago. I [illegible] that your fainting or vertigo fit was no more serious [illegible] and very that you will put in less water with the [illegible] [illegible] reading "Father Ian and the Pope" (have you ever [illegible]) [illegible] Christmas day, and [illegible] Father [illegible] [illegible] to make punch, [illegible] put in the sugar and [illegible] [illegible] of water you put in after that [illegible] I will [illegible] to explain [illegible] Howard how you fell, but perhaps it would [illegible] [illegible] give a full account of the matter. You yourself omitted [illegible] important [illegible]: "Did he hit the owl?" — Miss Howard [illegible] It would seem [illegible] within eight or ten days I have [illegible] these times without finding her at [illegible] or well; [illegible] was out and once sick abed with a headache. So I fear [illegible] not be able to see her again before she goes, which seemingly [illegible] within a very few days now.

I went last evening to see Mrs. Palmer, who lives with her daughter [illegible] Peter Wright [illegible] I [illegible] spoken of to you as an elder sister now in her seventy third year of Mr. Hopper's. [illegible] most admirable woman, and I take great delight in my calls upon me from time to time. She always has a great [illegible] of personal histories to recount in a most agreeable manner. She is so lively and in her feelings so youthful and in her looks so [illegible] that she seems always at least a dozen years younger than she is. Last evening Mr. Peter Wright had to go to a party nearby and left me a little while before Mrs. Palmer came down from [illegible] [illegible] old baby to [illegible] and from dressing for the party [illegible] [illegible]; for she had sent me word to wait for her [illegible]. [illegible] [illegible] to go to the party I could stay but a few minutes before she came down; but in even those few minutes she had time to give a very interesting account of [illegible] [illegible] Howell in whose house I told her the [illegible] were living this winter. Mrs. Howell is away, in Europe perhaps, and her house is kept by a maiden lady and her bachelor brother from [illegible] [illegible] of the [illegible]

[illegible] Brighton, and the Lesleys lived with them and as the house is small, have the best part of it to themselves, and [illegible] The house is a third story and above Spruce. Mrs. Palmer looked as if she knew the place and Mrs. Howell. "Oh, yes!" she said "she had known her ever since Mrs. Howell was born." Mrs. Howell you must know is Rebecca Harding Davis. Milton's blindness [illegible] was often seen ascribed to him, "Begins "I am old and blind". Mrs. Palmer said Katherine Lee Bates Whittier lived near as editor of the Antislavery Standard or what the Anti Slavery paper was called then, Mrs. Howell [illegible] was in love with him and he seemed to be "with her, but she never could be in love with one woman more than a few months and so he disappointed her. After that she married Mr. Howell, a widower, and she died very soon of small pox. Then Lee writes that herself as if she never [illegible] and kept herself shut up for years in Rathbone Place and even in Gower Street and notes and mentor visits were being written a square in her street. The after picture was also very bright, and ended with a man she had married California. The sisters and mother were Isaac and Edgar Lloyd and were first cousins. Mrs. Palmer mentioned the hatching and [illegible] because she as a Quaker is opposed to the [illegible] of women. [illegible] the willingness of the children [illegible] against her, [illegible] arguments against freedom. The children of the [illegible] were very bright and the girls were not [illegible] common women, but the five sons were [illegible] remarkable, strong [illegible] so far as the kind [illegible] with particulars [illegible] them [illegible] many children I remarked there were few quite as small [illegible] of character. Still [illegible] stained glass windows [illegible] the back room of the house [illegible] are lovely in, that [illegible] and a very pleasant view; and that seemed to be one of the Howells [illegible] part of the [illegible] sitting room [illegible] from the world. [illegible] also to have been a little envious [illegible] Mrs. Palmer thought [illegible] fifty-six years. [illegible] I might ponder as not to have written down more matters that [illegible] and [illegible] but [illegible]

I have lately got a copy of Lecky's Historical Sketches and find it a valuable treasure. That treats [illegible] all subjects. It is a pity that the [illegible] of former [illegible] should have held back so many people from reading things as for Spekter and Spectator with equal preliminary [illegible] in a few cases of various spelling [illegible] the book [illegible] grade above prominent. There also a full list of variously pronounced words with [illegible] the right. The [illegible] much better [illegible] [illegible] [illegible]

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135 South Eighth Street, Philadelphia; 18 Jan. 1889.

Edward R. Hardy.

Farmacy, O.

Dear Edward:

I have welcome letter of the thirteenth [illegible] to hand [illegible] and I am delighted to hear that your [illegible] at [illegible] are so good. I have been at some loss to make out [illegible] in speaking of my recommending you to make [illegible] region. It would no doubt be a very good thing for you to do [illegible] time in the future but you have [illegible] [illegible] material for such a work. It must be that you misunderstood my recommendation to you to make [illegible] of the section I [illegible] for you out of Mr. Lesley's [illegible]. If you will take the trouble to look at that copy you will see [illegible] is a [illegible] section of the rocks of your region (Coupe verticale [illegible] Durchschnitt, or some [illegible] the thickness of the different beds of rock is given. [illegible] to make a drawing in which these thickness are [illegible] a scale, so as to have at a glance a [illegible] of the relation of the different beds to each other. Here is a rough example of such a section; but you must have seen hundreds of them if you have read any books on geology. — I hope you will get the place of assistant in that [illegible] it looks very promising. — Coxe was here again [illegible] Monday, and he was pleased with your project of [illegible] Weisbach Ingenieur. I do not think it would be worth while yet to say anything to Weisbach about it, but would rather wait until the work is [illegible] under way. — Mr. Borda sent me last Thursday the following letter he had just got from Mr. Symons of Pottsville.

"Pottsville, Jan. 11th 1889. E. Borda Esq. Dear Sir: Your letter having been sent here [illegible] I was on my way to Tamaqua prevented my receiving it until the end of the week. I have been thinking the matter over, and I do not see any chance of employing it for any more hands than I have at present. In fact outside work is now so slack that I have found it necessary to discharge one of my hands. The surveys at Tamaqua are almost completed, except the town, which we think advisable to leave until

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the weather [illegible] — I am doing to get the mines of the Lehigh Navigation and Coal Company [illegible] and if I succeed I shall be able to find a position for your friend and will give it with pleasure. [illegible] respectfully, B. R. Symons." — I saw Mr. Borda Saturday morning and he said that Mr. Symons had not yet found out with certainty whether he should get that survey of the Lehigh Company. It will be an affair of some size, and he could employ you as his assistant, [illegible] in a very [illegible] position at first [illegible] it would give you [illegible] experience. [illegible] in the hands [illegible] work [illegible] and you would not [illegible] leave Pomeroy even temporarily now on an uncertainty or even for a certainty that is not so good as your prospects there, if it would interfere at all with those prospects. If this affair of Symons would come to anything I will post you. It certainly seems to me that your chances are better at Pomeroy than they would be [illegible] with this start. Besides you will find the climate more agreeable at Pomeroy than at [illegible], and perhaps the surrounding [illegible].

I am very much obliged to you for sending your catalogue of surveying books and for your offering to lean them. I may like sometime [illegible] is quite convenient to take a look at your von Oppel and Beyern; but it is not worth while to have them sent here on purpose. I may be in Cambridge some time and can see them then. If there is anything in Agassiz about surveying I shall want to look at that too; but I may very likely find that at some library here.

Eckley Coxe recommends, if you should make the translation, that you should have two extra copies of the book so that you can cut out the tables or parts of tables that need no change and paste them on your manuscript; but it would be time enough to do that when you are making the final copy of your manuscript. I can't say how much trouble in the way of translating technical works for you he would have leisure and inclination for; but you might make out a list of such words as you cannot find in the dictionaries, including the "Technologisches Wörterbuch" — a spoke of as for sale by Van Nostrand, and I could show it to him and get him perhaps to make the right [illegible] works against the German ones.

I met Freeman as well as [illegible] at Chicago last Summer and Freeman seemed to be a good fellow, at [illegible] more a geologist and perhaps even [illegible] than miner. I had supposed he had left Pomeroy for Illinois for good.

With best wishes Ever yours very truly. Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 18 Jan. 1869

R. H. Allen,

89 Wall Street, New York.

My dear Richard:

Your kind favor of day before yesterday is at hand enclosing the Home House of the same date. I will put off answering this last, as you recommend, until Mr. Malo's letter comes by the next mail. — I am afraid he and I shall never come to satisfactory terms with each other. I have no capital to invest as he proposes, and if I had would not do it, nor can I advise any friend of mine to do it for me. If he would furnish the capital himself and offer me a salary of a hundred thousand dollars a year, I should hesitate long before engaging to spend an years in the Andes or Cuenca. The six thousand a year he offers would scarcely be equal to six hundred in Massachusetts or sixteen hundred here. One whole year is much more than I would care to spend in that Cuenca wilderness; but I would like very well to make a trip to those regions for a few months, perhaps, without any over a year; and for a short trip would be satisfied with the terms I proposed. However, we will wait for his letter.

You are pretty cool to talk about my going on to spend a Sunday with you. Where is your promise to spend one here some time in the holidays? Answer me that well yes! To be sure it would be hardly fair to expect you to come on here on purpose to discuss my affairs, and if it should prove desirable for us to talk the matter over, and if you will promise to do better in the visiting way in future, it will give me great pleasure to accept your invitation.

Yours very truly,

Benj. Smith Lyman.

[illegible] Sept [illegible]

Dear Mary:

[illegible] Sunday came & found us [illegible]
[illegible]. Standish were [illegible] Mary & they would [illegible]
[illegible] me to do, and I was [illegible] you [illegible]
you were mistaken in it. I should have come myself in spite of [illegible]
[illegible] but I was [illegible] for a long [illegible]. Why [illegible]
[illegible] — I am glad to [illegible] [illegible]
[illegible] Kate [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible]

to are unfavorable to them. But I think the right to vote would have a good influence upon the education and character of woman; for if she is inferior to man it seems to be wholly from education. Even with improved education the character of the two sexes would be different, if on the whole equally fine. But it is now the education of women that is exaggerated very much and it seems to me very unfavorably to stand the real [illegible] in character of the sexes. Whether the laws would be essentially improved or not by the voting of women, or the management of state affairs be helped or not except from the indirect benefit of the improved character of one half of the people, is not so clear and is not of so much importance it seems to me. So much for my views on these matters that you asked for.

Edward Rowe left here a week ago last Thursday for Pomeroy, Ohio; rather suddenly at last, and by my advice. I had a letter from him last Saturday saying that he had a fair prospect of finding employment there under very favorable auspices, that he was glad he had gone there and that he intended to stay there and that he was pleased with the climate and with the place. He has very influential relatives and friends there, but two of them were just at present at Cincinnati. Pomeroy has coal mines, salt wells and an iron rolling mill and these friends are largely concerned in them. It is also not far from the coal and oil of West Virginia and from forty or fifty iron works in Ohio and Kentucky close by; so that it is a good centre for him to settle at, and he has but one or two rivals in the way of running engineers, in fact none I believe in respect to the actual working of mines, although there is one or two mine surveyors there. He was here a week in my rooms, and I got better acquainted with him than I had ever been before. Indeed, I had scarcely seen him at all, and had only a few letters from him. Perhaps your girls had given me too high an opinion of him, for I confess to a shade of disappointment and wonder at what had struck you all as so very attractive. Not but that he is a good natured good enough fellow, but not quite so extraordinary as I had expected. — Last Friday through Mr. Lesley's kindness I was elected a member of the American Philosophical Society here, a matter that I attach less importance to than he does. The society has long been living on its old reputation, but is trying to wake up now. Mr. Lesley himself is in good part the life of it. — He is just now in Baltimore [illegible] lectures this week and next before the Peabody Institute. Mr. Lyle is [illegible] [illegible] taking care of the library [illegible] the catalogue [illegible]

[illegible] Your affectionate Brother Benj. Smith Lyman.

[illegible]

135 East Fifty-Third Street, New York, 21 Jan. 1

[illegible]

[illegible]

My dear Friends.

[illegible] yesterday, came & went yesterday. I have been [illegible] of the [illegible] of the [illegible] & [illegible] [illegible] I received [illegible] a little [illegible] [illegible] [illegible]

135 South Fifth Street Philadelphia, 27 June 1859

A. H. Allen Esq.

No. 189 Water Street N. York.

My Dear Richard:

Before 10 A.M. at the mint this morning said that Messrs. Morgan and Orr (No. 1221 Callowhill Street, Philadelphia) had made mint machinery for Peru and other South American States, and were the men to do that kind of work. These manufacturers have on their sign: Iron Founders and Steam Engine Builders, and this place to be an old establishment, with still his upon the sign the old number 1000 that was abolished a dozen years ago at least.

I am happy to have been able to get such explicit information in the matter, and would be happy to do anything further that you might wish and remain

Very truly yours.

Benj. Smith Lyman.

135 Sarth Fifth Street Philadelphia [illegible]

Warren De[illegible] Esq.

No 15 Broadway, N. York.

My dear [illegible]:

Joseph Lesley this morning says that he has spoken to Mr Scott about the proposed railroad to Cumberland, or rather [illegible] Savage; and that he said the Pennsylvania railroad [illegible] would do as in other such cases: if your company [illegible] the road entire to the State line and grade it from [illegible] the Penna R. R. will lay the track from the [illegible] and [illegible] it. But Joseph suggests that [illegible] in the City [illegible] you should have an interview [illegible] Mr Scott personally; probably Mr Scott has [illegible] [illegible] (if not a desire) for such an [illegible] and I think it possible you might make a more favorable arrangement than the one now offered, although Joseph gave no such intimation.

Hoping then to have the pleasure of seeing you here before [illegible] as you spoke of having to come here this month, I remain

Affectionately yours.

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 24 Jan. 1869.

My dear Fanny:

Before your letter came yesterday afternoon I had in a dismale up my mind that it would be necessary to cross you off my list of correspondents; and thinking it had happened so by my own fault most likely, I had begun to sympathize most heartily with the woman who killed the goose that laid golden eggs for her. — I gave my friend the message you sent so kindly, and repeated my caution to him as you directed. But instead of seeing that what you said was a gentle extinguisher he persisted in taking it quite the other way; for you know that a puff that will quite put out a small flame only fans a larger one. He says that the flame he spoke of can resemble a well-o-the-wisp only in its dangerous feature, namely, in leading astray into trouble; for a will-o-the-wisp is but a glimmering light, of fitful beam, pale and wan, without heat and not long lasting. But if I should go on telling what he has to say, there would be no room for anything else, and you would quite break off this correspondence for being so very dull on the side; and that would perhaps only serve him right after all. — The Ledeys, whom you inquire about, are pretty well now; except that Mrs. Ledey has a headache today and is lying a bed. He has been at work all the week and for several weeks in writing on the Catalogue at the Library, every morning and often in the afternoon too. The children look quite well now though they have [illegible] particularly Mary. But both have a fine healthy color and I have heard no intimation that they were either of them specially delicate. They were not well for some time after their arrival here, but it was perhaps merely the change of life from country to city; and perhaps the food at the house they live in had something to do with it. The lady who keeps the house proves to be a very poor house keeper, and the [illegible] [illegible] extremely poor, but now they have the necessaries of life. Mr. Ledey is now in Baltimore, since last Monday and will be there most of this week, delivering four lectures before the Peabody Institute. He had been rather out of [illegible] for a couple of weeks before he went away, but seems to be doing very well there. He has fallen in there with Gen. Grant whose acquaintance

made [illegible] of Mr. Aubrey Smith about three weeks ago. At that time Mr. Lesley had quite an interesting talk with him and did not find him at all reticent. While Mr. Lesley is gone I preserve the library daily, at first because Mr. Dyke was sick and I might be of service there; but there is scarcely anything to be done there except help Aunt Susan over some fact or latin book little now and then. Mr. Lesley got me elected a member of the society ten days ago, his first chance since his return to the City, so that you may expect to secure an American philosopher — at least as much so as some of the other members of the society, I hope. I had no great desire to be a member of the society for it has lived for some time past more on its former reputation; but Mr. Lesley evidently attaches some importance to the matter, and the society in general evidently considers it [illegible] an honor to elect a man a member. Its Library is very [illegible] to me here, just over the street, and I may become acquainted [illegible] with some men it may be useful to know, although [illegible] not be [illegible] extraordinarily gifted nor agreeable men, yet influential and having a much higher opinion of their fellow members than of those who have not reached that dignity. Besides it is to be hoped that before long the [illegible] who have for many years past pretty much managed the society may be outnumbered by younger, more active and intelligent men. So I think I shall join the society, although not so ready and anxious to do so [illegible] to suppose. He wrote to Mr. Winsor [illegible] written from the other side of the world asking him to propose me as a member; and Mr. Winsor showed me the letter and offered to propose me if I wished; but I cared so little about it that I let the matter drop. Mr. Lesley proposed me now without consulting me. — You are very lucky to have a chance to hear Mr. Emerson's readings; it must be a great treat, and I am very glad it so happens that you have it. Perhaps you will have a chance to hear his Sunday afternoon lecture before you leave Boston, one of the courses that is advertised. — You and Mary seem to have had much the same experience about the woman suffrage petition. It seems to me that it is very well to sign the petition, but that you do yourself injustice in laying to cowardice your dislike for carrying the petition about to solicit signatures. This might well be disagreeable, distinctly for very satisfactory reasons quite different from timidity, [illegible] confounded easily with it. It is not pleasant to

[illegible] from any body whether expenditure [illegible] to [illegible] of especial, as long as you [illegible] [illegible] [illegible]

I think you will like living at Mrs. Hillard's very much. Edward Howe [illegible] said he understood that you were going to board at Mrs. Hillard's, and he got his information from Cambridge or Boston I suppose. Edward arrived here New Years day and staid until the next Thursday, with me here in these rooms. Finally he set out from here for [illegible] and he has written since his arrival there that he has a good prospect of finding satisfactory employment there, and is glad he went there. While he was here I got much better acquainted with him than I had ever been before in our two or three short interviews before; and I looked upon him with no little curiosity to find out what had raised him so high in the esteem of you girls. Although that curiosity was not altogether satisfied, he seemed to be a good natured enough fellow. Miss Kate Howard, however, thought him very much changed from what he used to be. She has just spent three or four weeks here, and I have been here two or three times by dint of calling on her six or eight times; for she was often out to tea with her relatives and former pupils, and often was laid up with sick headaches.

I went to see Mrs. Palmer ten days ago, but she was just going out to a party near by, and we had but a short talk together. She inquired after you and Mary very particularly, as usual. She asked after the Sedgwicks too, and on my telling her that they were living in Mrs. Howell's house, she gave me quite an account of Mrs. Howell whom she had known from birth. Mrs. Howell you know wrote a remarkable poem on Milton's blindness, a poem that has often been attributed to him himself. It begins: "I am old and blind." She had two sisters who were also very bright and another sister who was more like ordinary women. Mrs. Palmer mentioned with emphasis that Mrs. Howell was the daughter of two first cousins, Isaac and Elizabeth Lloyd; so I remarked that the unusual brilliancy of this daughter of the two other bright ones went decidedly against Mrs. Palmer's physiological notions, which she admitted. But she said the five brothers were not satisfactory characters altogether, although she said nothing to imply a deficiency of intelligence in them. Mrs. Howell had been very much taken with John G. Whittier when he lived here for a time, years ago, before her marriage; and he seemed taken with her, but he never could be in love with one woman more than a few months and so he went away and left her. After that she married Mr. Howell who [illegible] [illegible] [illegible]

135 South Fifth Street, Philadelphia, Feb. 1869.

Dear Father:

If you could find it convenient now to send me another draft for a hundred dollars, it would oblige me very much.

A letter from Mother has come duly to hand today; and the letter from Kate Quinn inclosed in it is very interesting indeed. — Mr. Warren Delano and Aunt Katy and Louise have arrived here this evening, and the ladies will stay here at the Continental until Saturday, while Mr. Delano goes on to Mt. Savage and back again. — Mr. Lesley got home last Friday from his lecturing trip to Baltimore and seemed more the worse for it, although he had worked hard all the time. He was in good spirits and health when he got home, but seems now a little under the weather. The rest of this family is very well.

Your affectionate Son,

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 4 Feb. 18[illegible]

Marshall Bonaparte Esq.
Sydney, C.B.

Dear Sir:

I find your favor of the fifteenth of last month still unanswered. Please tell your friend who wishes for my advice about rights of search that he will find it best worth his while to get it from me directly, if at all, instead of through another. Please recommend to him also in writing to me not to take the trouble to retail to my face with seeming belief any absurd slanders about me that may be afloat; for his doing so may lead me first to hesitate about answering him at all, and then by putting off a couple of days to forget all about it. You may assure him too, if you please, that I am not likely to give myself the trouble of studying up the matter of the best places to take out licenses on the chance of getting paid merely in case there should prove to be a good show! — I cannot quite understand why I should give up my just claim upon the whole proceeds of the sale of any of your real estate, until our account is settled, in exchange for twenty five or thirty per cent. of the same; nor why I should begin at this day to let myself be paid for geological work by a mere share interest in its result instead of by money.

Much pleased to hear from you that you now have health, energy and steadiness, and hoping that you will keep on improving, I remain

Yours truly.
Benj. Smith Lyman.

[illegible] Street, Philadelphia, [illegible]

[illegible] Esq.
Sydney, C.B.

Dear Sir:

[illegible]

Yours truly,
[illegible]

135 South Fifth Street, Philadelphia, 5 Feb. 1837

W. S. Lewis Esq.

Coal Dealer, willow St. above Broad.

Dear Sir:

Please send me tomorrow, as early in the day as you can, half a ton of Lorberry Coal, egg size, or coal as near like that as you can!

It struck me that the last load was only three quarters as large as usual, and it has seemed to be about two thirds of it only coal, the rest slate, leaving just about one half the full amount of coal. This is only a rough estimate; but if you could conveniently send the coal and slate separate this time (if I must have my share of the slate) I could then mix to suit myself, and you would greatly oblige

Yours truly

Benj. Smith Lyman.

125 South Fifth Street Philadelphia, 7 Feb. 1869

Dear Fred.:

Your favor of the fourth with its inclosure of a draft for a hundred dollars was duly and thankfully received.

The Delanos left here for New York, yesterday afternoon, Mr. Delano [illegible] Mr. Savage yesterday morning. Aunt Kate and Louise stayed at the Continental while he was gone and were frequently visited by the Lesleys and myself. The weather was bad most of the time, so they did not have a very good chance to see the city. Mr. Delano travelled two nights in the cars between here and Mr. Savage; I suppose he is so poor he can't afford to do otherwise. He would seem to be as badly off as if he were worth only three or four hundred thousand dollars. He and his wife seemed well and [illegible] and Louise did so at times. But she had lately had a nervous fever, and had while here several of her ill turns followed by headache and seemingly low spirits; she was, however, as well as usual.

I shall write very soon in answer to Mother's letter, but I want to keep Kate Quick's letter a day or two longer.

Give my love to all.

Your affectionate Son.

Benj. Smith Lyman.

Rose the great last Friday night at Mr. Lesleys American Philosophical Society.

185 South 5th Street Philadelphia, 18 Feb. 1869.

Charles J. Cook Esq.
No. 8 Bromfield St.
Boston.

Dear Sir.

Enclosed please find a post office money order in your favor for four dollars and twenty five cents ($4 25/100) for the Commonwealth from the first of April, 1868, a year and a half, and oblige.

Yours truly,
Benj. Smith Lyman.

135 South Fifth Street, Philadelphia, Feb. 19.

To the Editors of the American Naturalist

Salem

Mass.

Gentlemen:

Enclosed please find a money order from me in favor of the American Naturalist for [illegible] dollars and fifty cents for one year's subscription from the first of next month, and oblige

Yours truly,

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia, [illegible]

Prof. A. H. Worthen

State Geologist of Illinois.

Dear Sir:

I thank you very much for the third volume of the Report of the Geological Survey of Illinois received yesterday. It is a very handsome book and [illegible] credit both to the State and to the head of the survey.

I have found time yet only to read the first chapter, but have found that very interesting. [illegible] of the Kentucky Coal Measure section and of the Illinois one as given in the first volume of your Report is highly satisfactory and makes matters much clearer.

I had last the just to look at a small tract of coal land in Henry County, Illinois, near Rock Island, the N. W. Quarter of [illegible] 28 Township 17 North, Range [illegible] East. There was a coal bed well opened at the Diamond Mines close to the northern line of the tract and very near the northwest corner of it, but just within the southern edge of Section 21, on the South bank of Mineral Creek; and there was another poor coal opening nearly half a mile further east just within the northern edge of the tract in question and on the northern [illegible] of Mineral Creek. The coal at the Diamond mines answers well in thickness (two feet and a half), roof (slate), floor (three feet or so of fireclay, below which nothing is uncovered) and quality to your description of Coal Bed No. 1; and the other coal, half a mile to the eastward answers equally well in its roof (shaly with iron balls), and in its seeming distance above the other (although the dip, if uniform all [illegible] between them, might make the distance rather more than you give it) to your account of Coal Bed No. 2. I had taken them for No. 1 B and No. 1 C of your first volume; partly because the upper one seemed to be the coal mined at Shepard's Mine, two or three miles to the northwest, and that is said to have eight feet or more of bastard limestone above it and a dozen feet or more of fireclay under it, and to be three feet eight inches thick, and is of better quality than the coal of the Diamond Mines. But coal No. 3 may be small or wanting there.

I remain with many thanks

Very respectfully yours

[illegible]

35 South Fifth Street, Philadelphia, [illegible] Feb. [illegible]

Les Lesquereux Esq.

My dear Sir:

The third volume of the Illinois State Geological Report came to hand yesterday, and as I know that I am really indebted to you for it although with the regards of Mr. H. Worthen's written in T. Edmund but thank you for it too. It is a very handsome volume, but I am sorry to find nothing in it by you; although to be sure the conclusions of the first chapter are no doubt in part your work. The correction of the Kentucky and the former Illinois coal measure section seems very satisfactory and makes matters much clearer. I now see in the descriptions of coal beds No. 1 and No. 2 pretty certainly the coals No. 1 B and No. 1 C of the tract I looked at last summer in Henry County. The two coals exposed there answer very well indeed to these descriptions; the only possible difficulty is that the upper are seemed to be the same as a coal mined by a shaft [illegible] miles [illegible] and that was said to have eight feet or more of [illegible] limestone above it, as well as a dozen feet or more of fire clay under it. But perhaps coal bed No. 3 is not of much account in that shaft of [illegible] noticed.

The Lesleys are pretty well, [illegible] with one of her attacks of diphtheritic fever, but is getting [illegible] Mr. Lesley found [illegible] very ill indeed with pneumonia, and has been so now for a week or two. - My relatives at Northampton seem to be well.

Hoping that you and your wife are both well and that you enjoy the mildness of this winter, I remain ever

Very affectionately yours.

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 12 Feb. 1869.

[illegible]

I have read it to several of my particular [illegible], and it has won from them not only a [illegible] at its [illegible] by a [illegible] but admiration at its excellence as written by anybody. It gives a remarkably fine picture of [illegible] [illegible] and life [illegible] among the rich and among the poor, and [illegible] with such unpretending simplicity at the same time as to make it seem in parts like some paper by Addison in the Spectator. Such correspondence is worth cultivating indeed. She seems to be carried away by her personal feelings in regard to the [illegible] and to forget the palliating point in their case, but it is perhaps not quite uncommonlike to do so. For if men are apt to be [illegible] influenced by their feelings, women are perhaps [illegible] sometimes to be carried too far by theirs. [illegible] [illegible] would be all right again if she were reminded [illegible] [illegible] [illegible]

It seems as if a woman of her ability would do finely her [illegible] as a housekeeper to take the whole responsibility of keeping a house hiring and dismissing servants, making [illegible] of provision and the like.

I read the letter to Mrs. Palmer among others, and she was much pleased with it. I passed a very pleasant evening with her last Thursday; with her alone, because [illegible] had gone out [illegible], and [illegible]

over to [illegible] and did not feel quite well — [illegible] Before we [illegible] to New York to [illegible] [illegible] for some weeks, so I wished we just [illegible] Jenny surprised them from her visit [illegible] [illegible] [illegible]

[illegible]

135 South Fifth Street, Philadelphia
12 Feb. 1869.

Mrs. Caroline E. White
412 Spruce Street

Dear Madam:

In saying last evening that I would go to the German Club [illegible] Friday I forgot an engagement for [illegible] that will prevent my doing so.

With great regret that this [illegible]

[illegible]

[illegible]

P. S. "Its" occurs in Lucretius XXV:5. Also in Shakes, [illegible] in Measure for Measure (Heaven grant as its peace, but not the King of Hungary's); and three times within seven lines in the Winter's Tale, Act I, Scene 2.

B. S. L.

[illegible] Sixth Fifth Street, Philadelphia; 12 Feb. 1859.

[illegible] Diamond Esq.

[illegible]:

The third volume of the State Geological Report of Illinois, lately published, has just come to hand. It contains some corrections of the Coal-Measures section of the Kentucky Report and of those published in the former volumes of the Illinois Report, and gives a new numbering of the Coal beds and a new [illegible] of them. I am quite satisfied that the two coal beds [illegible] in Henry County [illegible] Sec. 28, T. [illegible] are the Nos. 1 and 2 of this third volume, the one at the Diamond [illegible] No. 1, and the one at the old [illegible] instead of No. 1B and No. 1C, the second and third from [illegible] as [illegible] in the first volume led to [illegible]. It [illegible] practical importance, however as the [illegible] thought to be of any value in that part of the [illegible] were all that could be hoped for, and there [illegible] under the present view of finding No. 3 in this [illegible] [illegible] above No. 2 to include it. As this third volume may not fall into your hands I will copy here in full [illegible] as a description of the beds No. 1 and No. 2.

(Page 10) The lower, or No. 1 Coal of the Illinois section, is the Exeter Coal of Scott County, which has been opened at many points in that and [illegible] counties on both sides of the Illinois river. It was originally worked in Scott County, near Winchester, and at [illegible] [illegible] eight miles from Winchester on the [illegible] landing, by [illegible] of [illegible] of superficial material that covered [illegible] of the streams. It is now worked at the [illegible] Hearth and in the vicinity of [illegible] by drifting into the [illegible] along the [illegible] and near Winchester by a shaft carried down through the drift and shale to the coal. At Beckeyville, [illegible] County, the seam was opened by a shaft and was found about 55 feet below the Beckeyville coal. In [illegible] County it is found at the base of the bluff one mile above Frederick and has been opened by drifting in Mr. Guillers place. It is usually overlaid by a hard bituminous slate which forms an excellent roof. In Scott and the adjoining counties this coal is usually [illegible]

finishing up with three feet of impure fire clay, might be a very good [illegible] above [illegible] succeeded by another seam five feet of [illegible] clay, of course [illegible] however, the lines are [illegible] and [illegible] directly on the [illegible] St. Louis group. [illegible] ranges from two to three feet [illegible] ores in this [illegible] the shale, & the roof contains a few [illegible] balls. Among [illegible] Fusulina cylindrica, Productus longispinus and Lingula [illegible] & [illegible] cannot be [illegible] whether [illegible] Seam has not yet been [illegible] fied, and [illegible] was [illegible] [illegible] [illegible]

135 South Fifth Street, Philadelphia; 12 Feb. 1869.

Mr. Benigno Malo.

Cuenca, Ecuador.

Dear Sir:

Your favor of the twenty sixth of last December with its interesting account of the vast mineral resources of your country is at hand and has been carefully read. It is indeed a great pity that such great riches should lie idle so long from lack of the capital and skill to turn them to account; and it seems as if it would quickly cease to be so, as soon as all the world should know, as you do so well already, the favorable condition of affairs there. Would not money and brains hasten to find employment there, if some thorough, trustworthy and unbiased account of these matters should be published? And would not such a work be done best at the expense of the land owners, merchants or inhabitants in general of your own country? Capitalists here would hesitate to risk even a few thousand dollars for this purpose, ignorant as they are of the real state of things there, while hundreds of better understood undertakings are asking for capital much nearer home. It is hard to make business men here believe that you who live on the spot and would benefit most by the working of your minerals are not looking through slightly rosecolored spectacles in describing the advantages of investing money there. Would not the best way of setting such unworthy suspicions at rest be for your government to order a thorough State geological survey of the whole country? The cost of such a survey would be a trifle compared with the advantage of giving to the world undoubted knowledge of such immense mineral wealth as you speak of.

I remain

Dear Sir,

Very respectfully yours.

Benj. Smith Lyman.

[illegible] Sixth Street, Philadelphia, [illegible]

Messrs. R. H. Allen & Co.

New York.

Gentlemen:

Your esteemed favor of the sixteenth of last month came duly to hand, with its proposals from your correspondent Mr. B. Malo of Cuenca, looking to my undertaking the case of a mining enterprise in Ecuador.

In answer please tell Mr. Malo that I could hardly afford to undertake such work in Ecuador on lower terms than those already communicated through Mr. R. H. Allen last November, and that even those terms would be hardly satisfactory for a longer engagement than a few months. Please say also that I have no capital at command for investment in such an undertaking; and that I should only be willing to go to Ecuador for a fixed [illegible]; that should depend in no way upon the final success of the project.

As it would give me great pleasure to tell the Andes and to serve your correspondent I must he will find my terms reasonable on the whole, and I remain

Very respectfully yours

Benj. Smith Lyman.

Gentlemen:

135 South Fifth Street, Philadelphia; 12 Feb. 869.

R. H. Allen Esq.

189 Wall St., New York.

My dear Richard;

Your favor of day before yesterday inclosing the Malo's letter of the twenty-sixth of last December came to hand yesterday. I enclose herewith my answer to his letter and to the one of your house of last month. I hope I am not so lengthy as to give you too much trouble in translating for him; at any rate my length is only about a quarter of his.

I could make out the drift of his letter by glancing through it and might have done better with the dictionary but I found it most agreeable to have the whole translated to me by an excellent friend here who has spent a number of years in Central America. I am very glad you did not take the trouble to write out a translation.

With many thanks to you for all the trouble you have taken in this matter in my behalf, I am, as ever,

Affectionately yours,

Benj. Smith Lyman.

[illegible] Philadelphia [illegible]

[illegible]

[illegible], D.

Dear Edward:

You will [illegible] favor of the [illegible] to [illegible] and I am delighted [illegible] that you have [illegible] to wait [illegible] a [illegible] [illegible] place. Of course [illegible] Mr. Grant and Mr. [illegible] find you [illegible] of real use [illegible] in the [illegible] doing even more than you are expected to do they will find a way to compel the directors to put you on the [illegible] [illegible] [illegible]. Of course you will find yourself doing a [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] it will all tell [illegible] or later.

I have never built any roads nor done the surveying for more than a [illegible] piece [illegible]; but I fancy that Mr. [illegible] is in the right after all in laying out the road as [illegible]. The difference between pioneer roads and [illegible] [illegible] [illegible] as much in the laying out it seems to me, [illegible] the building. A pioneer road ought to have [illegible] as carefully as any other for the trouble of doing that is small compared with the loss of labor by [illegible]. But as a pioneer road is less carefully built and drained it ought to be laid out if possible in such a way that the natural drainage would be good;

that is it should avoid as much as may be low wet places. Perhaps some regard too should be paid to the amount of wood chopping or clearing it will require; and to the way it would cut up land lots since such roads are likely to become permanent and the value of a piece of land, as left on one side of a road or surrounded by the road and the boundary lines may be much affected. Mr. Trautwine told me the other day that Gillespie's "Road Making" was a good book. I have not yet seen Trautwine's "Excavations and Embankments," but know that this is a good book. It is mainly I believe a set of tables and rules for calculating the amount of earth for cuts and fills.

I am glad Mr. Beckard turns out so well; there is probably more to him than [illegible] in the [illegible] minutes that I saw him in Chicago. I understand that [illegible] 192 Broadway [illegible] Waterlay's coal [illegible] if you [illegible]

I am pleasing to hear that the Ohio legislature is really considering the subject of a State Geological Survey. The State has been greatly needing a survey for many years. I should be very glad to have a finger in the pie.

You will find in the beginning of Gillespie's "Road Making" references to other works on the same subject.

The weather here is charming quite springlike, and must be quite as mild with you.

The Lyons are as well as usual except Mezzy who is [illegible] getting over another diphtheritic fever attack that began [illegible] [illegible] and [illegible] [illegible] Monday.

Ever affectionately yours. Benj. Smith Lyman

135 Rue Montmartre, Philadelphia, 16 Feb. 1867.

Dear Sir,

Here is what Mr. Gruner at the Paris Mining School writes about a certain process of making Bessemer steel from cast iron:

"Method of Mr. Chenot for the fabrication of iron direct from the mineral. After a few days practice he succeeded in getting results almost the same as the Terre-Noire Company. Instead of charging the converter with pig iron, he placed the mineral and blew through it a mixture of carbonic oxide (CO) and carbonic acid (CO_2). Then he added a certain quantity of spiegeleisen, which contained manganese. The inconvenience of this method was that the pig iron was mixed with foreign matters. The method was convenient only when the mineral was free from foreign matters. He found also that the fabrication of carbonic oxide (CO) was too costly, because the carbonic oxide made with ordinary air contained much nitrogen, and consequently much of the heat was lost in heating the nitrogen. He then placed alternate layers of mineral and charcoal in the converter, and closed the chimney of the chauffe. The oxygen of the mineral was taken away by the carbon, first forming carbonic oxide (CO) and then carbonic acid (CO_2). The mineral was then in contact with carbonic oxide (CO), but more often with carbonic acid mixed with nitrogen. But it was not necessary to expend much heat to reduce the ores which were reducible. The result was cast iron, which was then refined. At Millom, in Spain, the ore is first roasted, then smelted. The yield is about 50%. The consumption of coke is about the same as in the Bessemer process. The cost of the ore is about 4 francs per ton. The ore is roasted in kilns, which are 6 meters high, 2 meters wide at the bottom, and 3 meters wide at the top. The kilns are built on a hillside, so that the ore can be charged at the top and drawn out at the bottom. The ore is roasted for about 24 hours. The fuel used is coal. The ore is then crushed and sorted. The pieces that are too small are rejected. The ore is then mixed with limestone and coke in the blast furnace. The blast furnaces are 20 meters high and 5 meters in diameter at the widest point. The blast is heated to about 400°C. The pig iron is then cast into pigs. The slag is used for making cement. The pig iron is then refined in a puddling furnace. The puddling furnace is heated with coal. The iron is then rolled into bars. The bars are then cut into lengths and sold. The cost of the pig iron is about 30 francs per ton. The cost of the bars is about 50 francs per ton. The profit is about 20 francs per ton. The total cost of the iron is about 100 francs per ton. The selling price is about 120 francs per ton. The profit is about 20 francs per ton. The total cost of the iron is about 100 francs per ton. The selling price is about 120 francs per ton. The profit is about 20 francs per ton.

"But this process of Chenot seems to have come to nothing. For, if one fuses the iron, the manganese is separated, and one has immediately steel of fine quality.

"Voici la disposition des appareils à Millom. Les plus part des fours sont en France et en Espagne sont à deux cornues." (I leave out the description of the furnace. The retorts are 0m,40 wide, 1m,50 long, and 7m. high; and are built on a hillside so that the ore can be charged at the top and drawn out at the bottom. The ground at the top is on a level with the railroad which passes the kiln.) "On commence par remplir la cuisse en fonte ou réfractaire" (This is at the bottom of the retort and over the cast iron plate.) "jusqu'à ce qu'elle occupe la place. Puis dans la chauffe on remplit de lits alternatifs de charbon et minerai: 40 kilogrammes de charbon pour 200 kilogrammes de

rai. A mesure que la réduction s'avance il s'agit de faire descendre la partie réduite." (He goes on to describe the method by which a wagon is [illegible] from below and loaded and then taken out. The charging is done from above and the work goes on continuously.)

"On charge quatre fois par 24 heures. On affine les éponges. La consommation est très considérable. A Milhau, par exemple, 2640 kilogr. de minerai, 2000 kilogr. de houille, [illegible] charbon de bois. Il y a 14 cornues, 10 tonnes par 24 heures. Il ne faut pas conserver les éponges, car elles deviendraient oxydées.

"Cette méthode n'a réellement raison d'être que pour l'acier.

"La méthode Renton est imité de la méthode Chenot. Le minerai est mis dans des cornues qui sont chauffées dans la cheminée d'un four à réverbère et avec la chaleur perdue. L'éponge [illegible] dans le four à réverbère et est puddle directement. C'est une méthode perfectionnée."

The Jameson process then, would seem to be almost exactly the Renton and Chenot process, and no improvement whatever upon Renton's at least. Still it would seem to be very suitable for making steel; for the spongy carburetted iron could be put into a crucible and melted, the earthy impurities would separate, and steel would result. Of course for good metal pure ore, that is ore free from sulphur and phosphorus, would be needed; but so it is in the Bessemer process. They would seem not to have thought of melting the spongy mass in this way for the Jameson [illegible] into steel; and it would perhaps be worth while to suggest to them to do it.

I am going to set out tomorrow (wednesday) morning for Kingsgold, and expect to get home on Thursday or Friday.

Affectionately yours,

Benj. Smith Lyman.

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135 South Fifth Street, Philadelphia; 19 Feb. 1869.

Dear Mother:

[illegible] favor of day before yesterday came to hand last evening. I [illegible] very glad to have from you the particulars of Father's trouble with [illegible] eyes. What he said about them two or three weeks ago made me fear [illegible] anxious, but in the moment of writing the other day it slipped [illegible] my mind after all to inquire particularly about it. I trust that [illegible] is but a temporary difficulty that may pass away in a few days. I should suppose that the best thing for the eyes would be as complete rest as possible, and careful use after they get better. As to his resigning his office, although that will of course be necessary if his eyes should permanently prevent his doing its duties, yet I am afraid he would be less happy without the office than with [illegible] and should rather hope that he would keep it as long as he can [illegible] with its duties, even if his eyes should be used meanwhile [illegible] purpose. As for the amount of his salary, I think I could [illegible] manage by this time that it would not be much missed; for although I have for a couple of years or more earned no great income, [illegible] I feel pretty confident that I could get a pretty fair one, with enough to spare beyond my own needs, if I should carry out a [illegible] I have been thinking of for two or three weeks past. That is to go to Pottsville to settle. There are strong arguments for the step and (to me) against it; so I hesitate about taking it quite [illegible]. There is a great [illegible] of coal mines within twenty or thirty miles of Pottsville, [illegible] consequently a great deal of surveying and mining engineering [illegible] all the time. Pottsville men are employed for this work [illegible] men who live further [illegible]; and as there is nobody of much real knowledge in that line at Pottsville, and, it is said, only one surveyor there who is quite trustworthy for carefulness, I should stand a good chance of getting some steady work there, and work that would not call me very far from home, but perhaps work that would keep me there pretty constantly. This last is perhaps [illegible] the [illegible] most; for Pottsville seems hardly to be a very pleasant or intellectually profitable place to be shut up in for [illegible] years; but I may possibly be mistaken in this. My present kind of work, though so irregular, is in some respects more agreeable taking me to different regions, and living here brings me more in contact with scholars. I have not yet decided

a matter, and I would rather not have it said in the meantime that there is [I am thinking of it, and that] such an opening at Pottsville for fear some one else may step in to it. Mr. Lesley feels confident of my success, if I should go there; and that would agree with the experience of my acquaintance Pottwell, who was with me at the Paris Mining School and settled a couple of years ago at Wilkesbarre, which seems a less promising centre of business than Pottsville, though a more agreeable place. Perhaps other work may even occupy me so as to [illegible] for a time at least this Pottsville project. — The nibble of which I made mention the other day has not come to anything yet. Last Monday I started my terms to my friend, and he said he would think about it but I thought he looked a little as if he had not known how expensive it was to keep a private geologist by the month. He was [illegible] in the meantime to put me in communication with a friend of his in regard to the more important job to which his [illegible] [illegible] and for which he had already recommended one; and [illegible] my [illegible] to send to him. — I went up day before yesterday (for Mr. Lesley) to look at some iron works not far from Pottsville and spent that night and yesterday morning in Pottsville, and got home [illegible] last evening. This visit to Pottsville came very [illegible], and I was glad to refresh my recollections of the place. I found it seeming rather less disagreeable than I had been thinking, and it is quite possible that a man could live there quite agreeably after all. Still, I am not quite sure that five hundred dollars a year in a Massachusetts village would not be worth more than five thousand in Pottsville.

Early this week Meggy Lesley got well from her sickness, and at the same time Mary was laid up with a fever, from which she is now nearly well again. The climate or at least the change of climate certainly does not seem to agree with the children. Mr. Lesley set out on Monday for Rome, New York, to look at some iron works there, and is to be back today or tomorrow. He seems to be pretty well, and Mrs. Lesley is so. She says she hears nothing this winter from Uncle Joseph and the fears he is not as well as usual. Perhaps you hear something from Hamden on that subject.

Give my best to all.

Your affectionate Son.
Benj. Smith Lyman.

[illegible] Fifth Street, Philadelphia; 21 Feb. 1889.

My dear Fanny:

[illegible] very welcome and interesting favor of last Thursday came to hand [illegible] day before yesterday. Your message to my friend this time, if not [illegible] extinguisher, was a smotherer, or at least the threatened stoppage of all communication will serve as a screen; and indeed the only threat is so serious that I suppress in his behalf the message he would send back now, and he must make the best of it. — I am delighted to hear that you are enjoying Mr. Emerson's readings [illegible], and your own readings too. I, too, have this winter first made some acquaintance with the beauties of Paradise Lost and the poems of Milton. Having been inveigled last fall into buying a good fifty cent copy of Milton's poems, and having heard Mr. Trautwine say [illegible] or three years ago that he had never yet seen anybody who had read Paradise Lost through, I determined to devote to it and to the reading the book the half hour or three quarters that I have for such [illegible] before bed time, and some time since accomplished the feat [illegible] agreeably to myself. Since that I have just read through a similar copy of Scott's poems, though not quite [illegible] complete [illegible]. I am glad you have found your stay at the Hillards [illegible] just as I expected you would. Miss Kate Howard was [illegible] the other day to Aunt Susan of Mr. Hillard's [illegible] Opulness, in the selection of books for reading particularly, [illegible] pleasure with [illegible] she looked back on her stay in that house. I am afraid you may find your visit at Frank's less agreeable by contrast than if you had gone there before going to the Hillards. [illegible] your going to Brooklyn if you are wanted there they are [illegible] your visit of course, and have been all winter. I passed a most agreeable evening some ten days ago with Mrs. Palmer and she was to set out in a few days from then for her Son's in Brooklyn; so if you feel inclined you can drop in and see her while you are there, for she would certainly be delighted if you did, though I did not suggest any such possibility to her. She will be at "Mr. Chas. Palmer's, at 174 Carleton Avenue; go by the Myrtle avenue cars; close by De Kalb Avenue." After that she will be at "Mrs. Gibbons's, 33d Street, New York, opposite the Blind Asylum." That evening it happened that all the family had been invited out to a party at Mrs. Sarah's, Mr. Wright's sister,

it as they had been invited out on the night of my last call. But this time Mrs. Palmer was rheumatic and was going to stay at home; so she kept me there (or at least let me stay) until Eleven o'clock and after, and entertained me most agreeably all the time. I ventured to hint that in spite of my regret at her leaving Philadelphia for some weeks, I hoped the freedom from the daily and nightly care the talks of the Wright children would be good for her. She flared up good naturedly and said she wouldn't let her son say that; and that she hoped not to outlive her usefulness; that the care of these children was on the contrary a pleasure to her; that she knew her children in New York were thinking that she was getting old and would not last long, and thinking that they thought it was only fair that they should have what they could of her society though the rest of her life; but that she meant to live as long as two of her near ancestors did, who died at the age of ninety six, twenty three years older than she is now. I was delighted by this determination on her part and trust the may carry it out. As she is to be gone some time, I thought it barely possible that business might call me to Wilt before her return, and that I might see her there; and so I took her address. — Some three weeks ago I began going to the meeting of Mrs. White's German club, and have now been to three of them; to come this last week because it came on the night of the Philosophical Society meeting (which is however in some respects less agreeable). Last week, ten days ago, it was at Miss Hacker's, and the week before at Mrs. White's. The meeting was quite a good one at Mrs. White's, and to incur my talking German I was placed for the evening between two German ladies, Mrs. Shelton McKenzie and her unmarried sister, who were very [illegible] and agreeable. We played such games as twenty questions and to redeem a forfeit I told the story of the man with the long pistol, which seemed to establish my reputation for talking German. The meeting at Miss Hacker's was very small. A lady of German origin but Swiss education, Miss Bachman, a teacher of French in Miss Watson's school has been present at the meetings to answer questions on the language, and the latter distinguished herself it seemed to me at Mrs. White's by the readiness with which she could keep up a steady stream of talk in some of the games that required it, while the whole roomful was listening. But she hates the German language for talking, and that gave me a chance to practise talking French a few minutes with her while waiting for a car after Miss Hacker's meeting. Miss Bachmann, though she has little beauty and has not the freshness of early youth, nor probably much education, has some of that attractiveness of [illegible] that seems to be common to all French ladies, and [illegible] to German [illegible]

Mrs. Gibbons was present at Miss Hacker's meeting of the club. You know a little of Mrs. Gibbons's blundering way. The day before that meeting, she said she should see me there and that she wanted to tell me then of the [illegible] the Linnaean Society had been treating her. She also said "Why don't you set your cap for Miss Hacker; she is quite an heiress!" "Is she?" said I. "Yes," said she, "she has twelve or fifteen thousand dollars!" I thought she was going to say twelve or fifteen hundred thousand dollars, and was quite taken aback at the towness of the [illegible]. She thought I might set upon myself if I were going to [illegible]. At the beginning of the meeting Miss Hacker sat [illegible] near me and [illegible] talked a while with me chiefly in English [illegible] she does not feel much confidence in German, then seeing that we were not talking much German she urged me to go to Mrs. Gibbons, who looked up with expectation. But I fearing she had read the story of the Linnaean Society, declined [illegible] talk with somebody else and crossed over to [illegible], who is in some respects more agreeable. But the Linnaean story came at the end of the evening in one corner of the room, and was short enough. She had after holding the office of recording secretary for four months failed to get [illegible] on the ground, as she understood, of her sex alone; but [illegible] that that was only the mild form in which it had been put by her opponents. — Last evening I called at Mrs. Jackson's on Franklin Square, and found as usual that one of the ladies was in [illegible]. This time it was Mrs. Jackson, who had gone that morning. But Miss Lucy was at home and [illegible] cousin Miss Helen Thayer of Boston, the cousin of [illegible] future wife. She proved to be a lively, bright, well informed Yankee woman, going on towards thirty it would [illegible] and rather good looking; and she and Miss Lucy made the time [illegible] very agreeably. I had gone there with some [illegible] of getting Mrs. Jackson's consent to let Miss Lucy [illegible] a couple of [illegible] in Miss Lyman's School, but [illegible] the subject that Miss Lyman had [illegible] engaged their cousin Miss Ellen Dewey to begin [illegible] tomorrow on trial. Mrs. Jackson had told me [illegible] some time before, and finally Miss Lyman [illegible] me last Sunday to call on Miss Dewey the next day

I send her up to [illegible]. As I entered Miss Dewey's house on this [illegible] I was met by Mrs. Jackson who was there on the same business; for she had just come from Miss Lyman's. Miss Thayer seemed very much amused last evening at Miss Lyman's having "sent a young man to take me to take a look at Miss Dewey before engaging her to teach." I did my best to put it in a little different light, although I rather enjoyed the joke, and there was some truth in that view after all; for Miss Lyman was not sorry to have a [illegible] body's opinion besides her own to guide her in so important a matter where there was at any rate so little possibility of properly knowing the girl's capabilities of teaching without actually trying them in the schoolroom. — Last Wednesday I went up to the neighborhood of Pottsville to look at some iron works for Mr. Lesley, spent the night in that town, and came home again the next evening. Pottsville is ninety three miles from here, northwest, up the Schuylkill, at the great outlet of the principal anthracite region. I have thought seriously of late of going there to live, and feel sure that I could soon have there a sturdy, good business that would not call me far away from home. There are so many mines within twenty or thirty miles that there is always geological work and surveying and engineering to be done for which the local engineers are employed. Still, on many accounts I prefer having my headquarters here with any present business very irregular [illegible] this city is better in almost every way to live in than Pottsville, and this kind of work is perhaps pleasanter than the other would be. And yet there is so much to be said in favor of going to Pottsville, that I am not yet decided whether to go or not. With the spring there comes more talk of business here, and by waiting a while some of the talk may come to something. — At Pottsville the evening in the barroom was helped off very agreeably by two Italian musicians one of whom played the harp very well and gave us choice pieces out of a number of the best operas, besides singing by special request the Garibaldi hymn and a French song although singing was not quite in his line, and giving some of the popular tunes, such as Captain Jenks of the Horse Marines, of which I had never known the name before.

Very affectionately yours.

Benj. Smith Lyman.

135 South Fifth Street, Philadelphia; 22 Feb. 1869.

J. S. Macleffen Esq.
Sydney, C.B.

My dear Sir:

Your favor of the sixth of this month came to hand last week on the eve of my setting out for a short trip to the mountains. I think on the whole it would be best to take Brutilier's offer, if it can be arranged so that you can have $200 clear of all expenses. But I have under that arrangement you will have yourself quite a little compensation for all the trouble you have taken. If you can fully satisfy yourself in that respect, I should be content with the $200 net. If I should within a week (before you get this) see fit after all to countermand the sale and take the risks of keeping the land a while longer, I will telegraph you to that effect; so that you can sell on receipt of this unless you should get before that a telegram to the contrary. It would only be fair for me to pay you something now on account for your trouble in the Bourinot judgement; and I wish you would feel no delicacy in taking a liberal compensation for what trouble this matter has already given you, whatever hole it may make in the $200: If there were any way of making Bourinot pay up his debt I would gladly pay you handsomely for bringing it about, and of course expect you to be finally repaid in full for your trouble whenever he shall settle up. — To judge from some letters of his to me lately, he seems to be really in a very pitiable condition. He would seem sometimes to be hardly

[See p. 235 for continuation]
(by mistake)

125 South Fifth Street, Philadelphia; 22 Feb. 1869.

Marshall Brownrigg Esq.
Sydney, C.B.

Dear Sir:

Your favor of the Eleventh of this month is this day at hand. I am very far from wishing to taunt you with your inability to discharge your debts or to add to your discouragement in any way. What I meant in the passage you cannot understand is that it seems unreasonable that I should exchange my claim upon the whole of your property (until the debt is paid) for a certain percentage of its sales, no matter what that percentage may be. – I have read over my letters to you of the 27 Aug. and 30 Sept. 1868, and find in one no shadow of a foundation for the claim you set up, and that it is utterly preposterous to set up any such claim upon anything in the other. If you are sincere in in imagining such a claim to be well founded, my command of the English language is quite too imperfect to make you understand me, and our correspondence would better come to an end forthwith. – I will say (for the third time) that if your friend wishes to make any arrangement with me, he would do well to apply directly to me. He may possibly understand me more clearly at first hand than at second.

Yours truly.

Benj. Smith Lyman.

in his right mind; he makes at times the most extravagant and absurd claims upon me, and will state and misstate. He says one thing to help sell him on his legs again by helping him to a reasonable claim for speculation. I do not see how I can help him without probably adding many losses by him, which are already much greater than he probably suspects. Words seem to be quite lost upon him and he returns feebly to the attack; just as I shall have to break off abruptly the correspondence with him sometime, I fear. — I am very sorry to hear that your health and Mrs. MacQueen's is no better than it is this winter. The spring promises to be an early one; indeed, if it should not prove so our trees will suffer very much, for the maple buds were bursting, outside the city, more, a week ago. I trust that with the return of milder weather exhilaration and vivacity of all kinds will bless your household. If ever I should get comfortably established, I shall hope to have a visit from you sometime, and I trust that Mrs. MacQueen could sometimes come up to [illegible] and see in what manner our old claim is held here. — The winter has been a very remarkable one here for mildness; we have had never more than one or two of severe cold, only three times as much as that and it has lasted but a couple of days at most. — My life here is quite a quiet one. I go but little into society. Once a week I go in the evening to the meetings of the Academy of Natural Sciences, twice a month to the meetings of the American Philosophical Society, and once a month to the Franklin Institute. Once or twice a week besides I meet a few of the scientific and intelligent men at the houses of two or three; and the other evenings are pretty taken up with visits to friends and now and then a little social gathering. There is a weekly meeting of a club of ladies and gentlemen for practice and amusement. The numbers are small, but with a little brightness as the spring opens. I have begun with a book on surveying, to be a very complete thing, if I can get it. — I am glad to hear from you a word or two of Nicholas Bowditch. He is a noble fellow, and of the purest type of whom I could talk with you. [illegible]

135 South Fifth Street, Philadelphia; 26 Feb. 1869.

My dear Sanborn;

Your very welcome letter of night before last is at hand today, and with it the newspaper, for which I am greatly obliged. Mr. James Barnard was here yesterday morning on his way to Boston and told me that you had read an excellent paper at Albany, and that the meeting there had been in general a pleasant one. I have read the report of it in the paper and like your views very much, and hope your plan will be carried out. Mr. Barnard seemed to think that there would be a meeting of the association here before long. — I read your communications in the Republican with much interest and recognize some of them as yours, and others I recognize as coming probably within your line but not quite in your style it seems. Although there are many interesting personalities, however, there is not much about your own family and my Springfield acquaintances so seen in the newspapers I am very glad to have a letter from you. — I have thought that your journal might profit by a few hints in regard to the project for a canal across the Isthmus of Darien. The great authority on that subject is my particular friend Mr. Trautwine here, who spent a number of years in those parts. He looked particularly at the proposed line for a canal up the Atrato River and found that the cheapest plan would cost three hundred millions of dollars and was therefore impracticable. He seems to look with no sort of faith upon the project now attached of building a canal across for one hundred millions, indeed he seems to think it absurd and based upon grossly underrated estimates of removing the cubic yard of material; and he has had experience in building there, on the Panama Rail Road. The plan seems to be to get the government to begin the building of the canal, and if a hundred millions be once laid out upon it, it will not be so very hard to get another hundred to go on with it and then another hundred or two to finish it. It will be a worse job than the Pacific Rail Road job; and it seems now hard to understand how this road can be run except patriotically at the government expense. — Did you notice the telegram from Washington in this morning's Philadelphia Morning Post (perhaps in other papers too)

but an interview between my dear brother McClure and Gen. Grant. It threw a brazen and infernal impudence of McClure in a fine light. It was probably prepared for the press by McClure, and rather makes out Grant to have been more cowed by him than I was in my interviews with McClure. He mentioned one point decidedly in Geo. H Stuart's favor, namely that McClure and he were not at all acquainted. Another thing that goes against Stuart as a man of sense is that he was the signer or one of the signers of certain certificates or tickets that were issued in the winter of 1858, declaring that the holder, who had paid so many cents a week for so many weeks, was entitled to a free admission to the heavenly kingdom & to crown of glory, a robe of white and a seat on the right hand of the great ruler. I did not use one of these tickets myself, but plenty of my friends did at the time. They caused something of an outcry about town among the magnates, and then were unexpressed. I suppose he would make an honest Secretary of the Treasury and perhaps a good manager of the office and organizer of its forces; but I have never heard of his being much acquainted with political economy. I should think D. A. Wells would make a very good Secretary of the Treasury, as the Republicans recommended McClure. — McClure bearing towards Grant according to this telegram calls to mind the character of Indians in old times who felt sure of a certain number of scalps with plunder and fighting glory and were fairly beat as their arts and the fact that such character comes to old warriors leads me to suppose that Grant became little by degrees since these times not merely in the manner in which political power is struggled for, but in the spirit; that there is after all in general less of the great principle than formerly. — I discovered last Monday that there was a small German theatre in this town, and Dr. Ellis and I went that evening. The stage was small, at the end of a long narrow room — but was filled with three or four rows of tables running lengthwise of it and a crowd of Germans sitting about. There were the young men in high spirits and the whole house in the full swing of opera, theatre and music and the respectable and respectable married men; in short all ages from three months, more or less, to decided old age. All seemed to be Germans and I believe all were content to drink nothing stronger than beer and eat nothing more costly than pretzels (or the like). The play too carried me back to Germany; it was a Volksstück, or folk-piece function, in five acts (with long intermissions for drinking) and was pretty well acted. There were some pleasing faces among the audience among the young women and the little children, and my admiration for the good qualities of the people was renewed; and I could not help thinking what a mighty institution it would be if every body in it would have every day. If Bismark were to compel every human to that, the Germans would be thoroughly established at the head of Europe in twenty years. They may be after for him even without that, but not so surely nor so fast as in the case. Give my regards to your family and believe me ever very affectionately yours

Richard Smith Lowe

135 South Fifth Street Philadelphia,
1 March, 1869.

To the Postmaster
at Rome, N. York.

Sir:

On the fifteenth of last month I mailed a letter to "Prof. J. P. Lesley, Rome, N. York"; and, as he did not get it before leaving that place, please be so kind as to forward it to him here, to No. 104 South Fifth Street, Philadelphia. He has already written back the same favor to me, but owing perhaps to the miscarriage of his letter or to his forgetting to give his present address, he has not yet received the letter; and now wishes me to ask you to forward any thing you may have for him.

Respectfully yours.

Benj. Smith Lyman.

135 South Fifth Street Philadelphia,
1 March, 1889.

To the Postmaster
at Rome, N. York.

Sir:

On the Sixteenth of last month I mailed a letter to "Prof. J. P. Leslie, Rome, N. York;" and as he did not get it before being that place, please be so kind as to forward it to him here, to No. 101 South Fifth Street, Philadelphia. He has already written to ask the same favor of you, but owing perhaps to the uncertainty of his letter or to his forgetting to give his present address, he has not yet received the letter; and now wishes me to ask you to forward any thing you may have for him.

Respectfully yours,

Benj: Smith Lyman.

135 South Fifth Street, Philadelphia; 1 March, 1869

Dear Mary:

Your favor of the twenty-sixth came to hand on Saturday and rejoiced me very much by its encouraging [illegible] of Father's trouble with his eyes. I trust that the hopes that Dr. Williams has given us will not prove false, and that now the cause of the trouble is understood any repetition of it will be wholly avoided. — Henry Hinckley arrived in Philadelphia Friday night and came to see me here yesterday afternoon, and made his call in very agreeable one as he is always sure to do. He was to go on to Washington today and to stay there until the end of next week — not thinking he could "get the Northampton post office in less time than that." There is a great deal of jiking going on about all the people who are going on to help inaugurate Grant. Mr. James Barnard favored me with a call last Thursday while on his way with some ladies from Boston to Washington. These are the only two of my acquaintances who are going to the inaugural line, but that indicates no doubt a very large number bent upon the same thing with whom I am not acquainted. ~~[illegible]~~ That Col. McClure who had the impudence to talk so to Grant is the same who is one of my debtors and whom I had such fun dunning to no purpose last spring. To my delight he has dished not only his own but Curtin's political hopes. — Hunt Butler's engagement took me quite by surprise. Some two or three months ago I met him in the street and he said he had just come from Northampton, which rather surprised me then, as he had been there not long before, and was formerly in the habit of not even writing there except at long intervals. He did not use to seem coppery at all, so I trust Miss Lathrop is not too much so. — Mary and Meggy have got well, but Mary had scarcely left her bed when Annie Susan herself was taken sick with the same ailment, diphtheria, which she had taken from the children it would seem. But she is reported to be a good deal better now though as I understand still in bed. Mr. Lesley seems pretty well and is off again today on a two days' trip to York County in this state to look at some iron ore beds.

[illegible]

[illegible]

Dear Mary:

[illegible]

2 March 1859. — Mrs. Palmer went to New York a fortnight ago, but had hardly got there, with the expectation of staying several weeks, when she was telegraphed to [illegible] house. Mr. Peter Wright, her brother-in-law had been struck with paralysis, that still (as late at least as last Saturday) leaves him speechless and affects one half of his body; but he is conscious and understands what is said to him. It is a very serious blow. I believe I wrote how Mr. Hopper was knocked down in the street by men running to a fire and had his arm badly broken. I was at his house on Saturday evening and found him doing pretty well and in good spirits, although he had twinges of pain now and then in his shoulder, where the bone seems to be cracked. The same arm was broken many years ago, and he thinks it must be by this time such a curious object that he has bequeathed the bones of it to the museum of the medical department of the University here, he says. He said that Mr. James Gibbons of New York had arrived in his house the night before on his way home from Washington, and had been taken serious ill; so that I did not see Mrs. Hopper who was nursing him. — I was at Aunt Swans last evening and found her getting better, half sitting up in bed, and very chatty. The children seem both to be well. — I have this morning a letter from Edward Howe who is still dating before the wind at Pomeroy and is filling the place of a virtual assistant superintendent of the Pomeroy Iron Works, a considerable rolling mill. The superintendent is away on business a good deal of the time and Edward has to manage things in his absence, and see that things go on well. He certainly seems to be in luck, and it seems as if he might get married as well as not within a few months; and that is much better than he had a right to expect when he became engaged. — Last Tuesday Stockton by invitation at the Bliss, and four or five young folks mostly ladies were expected to be of the party; but owing to bad weather only one young lady and gentleman besides myself were there. The young ladies, both there who was there and those who were not, were former pupils of Miss [illegible], and one in whose special honor the entertainment was got up has been making a visit here from Cambridge, and was a boarding pupil here a few years ago.

Give my love to all. Your affectionate Brother.
Benj. Smith Lyman.

[illegible] Fifth Street, Philadelphia; 3 March 1869.

Mr. Edward R. Howe,

Pomeroy, Ohio.

Dear Edward:

Your favor of the twenty fifth of last month came to hand yesterday, and the same day I forwarded to you by Express (the "Central," which seems to have absorbed the Hamilton and Howard) the three books you asked for, and it gave me pleasure to be able to serve you in that way. The Taylor's Statistics cost three dollars, the Urbin one dollar, and the Nystrom two dollars, making six dollars in all. The Taylor is not very clean on the edges of the leaves but seems to be sound and on the inside in good condition, and perhaps you can have the edges either trimmed in rebinding sometime or colored dark without rebinding. It was the only copy left at Leary's, and a new copy at Baird's proved to cost twice as much. It turned out at Lippincott's that they had no more copies of Nystrom in sheep, at $4.75, and they thought too that those copies were of an earlier edition; and the "tuck" copy cost two dollars, which seems to be a good deal less than their catalogue price; so I took the responsibility of getting it. — Have you got "Bauerman's Treatise on the Metallurgy of Iron; containing outlines of the History of the Iron Manufacture, Methods of Assay and Analysis of Iron Ores, processes of Manufacture of Iron and Steel; [illegible] edition, revised and enlarged, with an appendix

Mr. Edward Hale,
Philadelphia, Pa.
1869

Dear Sir:

on the Martin process for making steel, from the report of Abram S. Hewitt; illustrated with numerous wood engravings; one volume 12 mo, cloth $2.50" published by D. Van Nostrand 192 Broadway, N.Y. It would seem by its advertisement to be a good book and not dear. Percy's Metallurgy of Iron seems to be a good book too, but probably dearer somewhat, a stout octavo.

The Leleys are much interested in hearing of your good fortune. Mr. Leeley is just now out of town on a little geological work for two or three days. Mrs. Leeley is just getting over an attack of diphtheria which she seems to have caught from the children who had it one after the other; so they have had somebody sick a bed there for three or four weeks almost all the time.

Business here is still very dull though perhaps looking a little better than when you were here. I had a little trip of a day or two up to Pottsville some ten days or two weeks ago, and saw that pleasing place for the first time in six years. I went in fact to Ringgold to look at the Iron works there, but found them out of blast, and one furnace pulled down.

I am delighted to hear that you are getting on so well and that your prospects are so promising, and hope that things will turn out even better than you look for; and I remain as ever

Affectionately yours,

Benj. Smith Lyman.

Dear Sir,

Yours truly,

[Christian Examiner Journal of History.]

The Blue Flower.

From Heinrich of Ofterdingen, an Unfinished Novel by Novalis. Translated from the German by Benjamin Smith Lyman.

Friedrich von Hardenberg, who died at Weissenfels in Saxony, in 1798, and died in 1801 not quite twenty-nine years old, but already much admired and lamented under the name of Novalis.

In the early days of the Middle Ages there lived in the land of Thuringia a young man named Heinrich von Ofterdingen. His father had been a rich merchant, and had left him a handsome property. Heinrich had received a good education, and had been brought up with the greatest care. He was a youth of about twenty years of age, of a lively disposition, and of a mind naturally inclined to poetry and meditation. He had already made several journeys into the neighboring countries, and had begun to feel a strong desire to see the world and to become acquainted with men and manners.

One day he set out with a party of merchants who were going to Augsburg, where he intended to dispose of his property and to purchase goods for the Thuringian market. He had already passed the boundaries of his native country, and had entered the province of Franconia, when, on the second day of his journey, he came to a village at the foot of a peaked hill that was broken up by deep hollows. The country was fruitful and pleasant, although the tops of the hills had a dead, forbidding look. The inn was neat, the servants were ready and willing, and a number of men, partly travellers, partly mere drinking guests, sat in the room and chatted on all sorts of things.

Our travellers mingled with them and joined in their talk. The notice of the company was drawn above all to an old man who sat in a foreign garb at a table and answered good-naturedly the questions that were put to him. He came from foreign parts, had that morning made a careful ascent through the neighboring country, and was now telling about his trade and his observations of the day. The servants called him a treasure-digger. But he spoke very modestly of his knowledge and power, although what he said bore the stamp of strangeness and wonder. He said he had been born in Bohemia. From his youth up he had had an eager longing to know what was hidden inside of the mountains, to know where the water in the springs came from, and where were found gold and silver and the precious stones that men drew to themselves in spite of everything. He had often looked in the neighboring cloister chalk at the flaming lights on the pictures and shrines and only wished that they could talk to him, so as to tell him of their mysterious source. He had sometimes heard that they came from far off countries; but he had always wondered why there should not be such treasures and jewels in his own neighborhood. Surely the mountains were not for nothing so long and lofty and so strongly barred; it had seemed to him as if he had sometimes formed shining and glittering dreams in the mountains. He had clambered about busily among cliffs and caverns, and had looked around him with indescribable pleasure in those most ancient halls and [illegible] At length he then fell in with him one day a traveller, who told

he ought to become a miner, and then he could satisfy his [illegible] for knowledge. ~~But~~ That there were mines in Bohemia. That he [illegible] only to go right down the river; that after ten or twelve days he [illegible] be in Eula; and that there he had only to say that he would like to [illegible] a miner. He did not need to be told that twice, and he set out [illegible] very next day.

After a tiresome walk of several days, he went on to say, [illegible] I came to Eula. I cannot tell you how gloriously I felt when from a hill I caught sight of the harps of stones, that were grown over with green bushes and had wooden buildings upon them; and when I saw the clouds of sun the rise over the woods out of the valley below. A few [illegible] noise still further raised my hopes, and with more wonder than you can believe and full of silent devoutness I stood soon on such a heap (which they call a tip heap) before the dark depths that inside of the buildings led down into the hill. I hurried to the valley and soon met some men with lamps and clothed in black, whom I rightly took for miners; and with shy uneasiness made my wishes known to them. They listened to me good naturedly, and told me just to go to the smelting furnaces further down, and ask for the captain, for so they call their leader and master; he would let me know if I could be given a place. They said that I should likely get my wish easily; and they taught me the come man greeting, "Good luck!"* with which I should address the captain. Full of happy hopes I went on my way, and could not

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*"Glueck auf!" The true meaning of this greeting is unknown even to many Germans. According to a very old account of it the meaning would seem to be: "May you have the good luck to open up (Glueck aufzuschliessen) rich ore!" On the other hand "Glueck zu!" was thought by the miners to have a bad meaning, namely: "May you have the luck to have the rich ore veins shut to (zuzuschliessen) against you!" – Translator.

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make an end of saying over to myself this greeting so full of meaning. I found an old, venerable man, who welcomed me with great friendliness; and after I had told my story and [illegible] how great a mind I had to learn [illegible] [illegible] readily [illegible]

he ought to become a miner, and that he could satisfy his [illegible] for knowledge. [illegible] in Bohemia. [illegible] only to go right down the mine; that after ten or twelve days he [illegible] be in Eula; and that then he [illegible] a miner. He did not need the old [illegible], and he [illegible] very [illegible].

After a [illegible] of several days, he went on [illegible] I came to Eula. I cannot tell you how [illegible] felt when from a hill I caught sight of the [illegible], that were grown over with green [illegible] wooden buildings upon them; and [illegible] the [illegible] over the woods out of the [illegible]. [illegible] still further raised my hopes, and with more [illegible] than you can believe and full of [illegible] I [illegible] on [illegible] a [illegible] (which they call a [illegible]); [illegible] that [illegible] of the buildings [illegible] down into the hill. I [illegible] the [illegible] and [illegible] with lamps and [illegible] in black, [illegible] for miners; and with [illegible] made my [illegible] them. They listened to me good-naturedly, and told me just [illegible] further down and ask for the [illegible] for so they call their leader and master; he would [illegible] if I could be given a place. They said that I should [illegible] get my wish easily; and they taught me the [illegible] greeting, "Glück auf!"* with which I should address the [illegible]. Full of happy hopes I went on my way, and [illegible]

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*"Glück auf!" The true meaning of this greeting is unknown [illegible]. According to a very old [illegible] the meaning would seem to be: "May you have the good luck to [illegible] (Glück auf zu schlüssen) [illegible]." On the other hand "Glück zu!" was taught by the miners to have a bad meaning namely: "May you have the luck to have the rich ore veins [illegible] (zu zu schlüssen) against you!" – Translator.

[illegible] over to myself this greeting so full of [illegible] old venerable man, who welcomed me with great friendliness; and after I had told my story [illegible] great a mind [illegible]

I seemed to please him, and he took me into his house. I could hardly wait for the morrow, when I was to go into the mine and see myself in the charming garb. That very ~~night~~ evening he brought me some mine clothes, and showed me the way to use some tools that lay stored away in a chamber.

In the evening some miners came to see him, and I lost not a word of what they said, however strange to me and beyond my understanding were both the words and the greater part of the matter of their talk. I did the little that I thought I took in addition to the wellness of my wish to know more, and kept me busy at night with strange dreams. I awoke betimes, and event to my new host, around whom one by one the miners gathered together to take his orders. A room close by had been made into a little shaft. A monk came in and read a mass, and after that made a solemn prayer, in which he called on heaven to take the miners in its holy keeping, to uphold them in their dangerous work, to guard them from the attacks of and wiles of evil spirits, and to grant them to strike rich veins. I had never prayed with more warmth and had never taken in the high meaning of the mass in a livelier way. My future comrades seemed to me heroes of the nether world, who had to overcome a thousand dangers, but had at the same time a most enviable lot with their wonderful knowledge, and in their earnest, silent fellowship with the rock sons of nature became fitted to have heavenly gifts and to be lifted up with joy above the world and its griefs.

After worship was over, the captain gave me a lamp and a little wooden crucifix, and went with me to the shaft, as we call the steep entrance into the underground workings. He taught me the art of going down, told me the needful rules of foresight, as well as the names of the manifold things and their parts. He went on in front, and slid down on the round beam, while he held with one hand to a rope that slid along with a loop on a side rail, and in the other hand carried the lighted lamp; I followed his leading, and we soon reached a good speed on pretty great depth in that way. I was strangely awestruck, and the front light twinkled like a lucky star that showed me the way to the hidden treasury of nature. We came to the bottom into a labyrinth of galleries and my good natured

was never tired of answering my questions, nor of telling me about his art.

The rushing of the water, the distance of the surface where men dwell, the darkness and crookedness of the galleries and the far off noise of miners at work greatly delighted me, and I felt myself now with joy to have in full what had ever been my strongest wish. No one can unfold and set forth this fulfilling of an inborn wish, this wonderful joy in things that seem to be long closely tied up with our inmost being, with the business for which you have been called and fitted from the cradle. Perhaps they would have seemed to any body else common, unmeaning and disagreeable; but to me they seemed as needful as air to the lungs or food to the stomach.

My old master was pleased with my hearty enjoyment, and promised me that by working so busily and so carefully I should get on well and become a skilful miner. With what devotedness did I see for the first time in my life on the sixteenth of March, forty five years ago, the ring of metals in fine leaves between the joints of the rock. It seemed to me as if he were shut up here in a strong prison and begged kindly of the miner who had with such great dangers and hardships broken his way through the strong walls to him, to set to bring him out to the light of day, that he might carry to honor as royal crowns and vessels and holy relics, and in valued and well guarded coins adorned with likenesses rule and guide the world. From that time I longed in Earth, and rose step by step to be a cutter (that is, the real miner who works in the rock), after I had been set, to start with, to carrying out in baskets the loosened lumps of ore.

The old miner rested a little from his account, and took a drink, while his watchful listeners gave him a cheerful "Good luck." The words of the old man rejoiced Henry very much, and he felt very much like hearing more from him.

The listeners talked with each other of the dangers and wonders of mining, and recounted strange tales, at which the old man often smiled, and in good naturedly took the pains to set them right in their odd notions.

After a while Henry said: You have likely since that seen and undergone many strange things; it is to be hoped that you have never been sorry for the life you chose? Would you be so kind

days as to tell us how it has gone with you since then, and as what journey you are now engaged? It seems as if you had looked about a great deal in the world, and I can see in that you now stand for more than a common miner.

It pleases me well to, said the old man, to recall the times gone by; I find in them reasons for rejoicing in the mercy and goodness of God. Fate has led me through a happy and cheerful life, and not a day has passed that I have not laid myself to rest with a thankful heart. I have always been lucky in my affairs, and our father in heaven has shielded me from the evil one, and let me grow gray in honors. Next to him I have to thank my old master, who has long since been gathered to his fathers, and on whom I can never think without tears. He was a man of the olden time, after God's own heart. He was gifted with deep insight, and yet childlike and humble in his behavior. Through him mining came into a very flourishing state and brought vast wealth to the Duke of Bohemia. The whole country became very that means well peopled and thriving, and is now a blooming land. The miners add honor to him as a father, and as long as Eule stands his name will be spoken only with feeling and [illegible]. I was by birth a Lausatian, and his name was Werner. His only daughter was still a child when I came to the house. My industry, my faithfulness and my warm attachment to him won his love for me more and more every day. He gave me his name, and made me his son. The little girl became grown up, a cheerful, lively creature, whose face was as pleasantly smooth and white as her nature. The old man said to me often, when he saw that I was glad to play with her and could not keep my eyes off from hers, that were as clear and open as the sky and shone like crystal; he said, that if I became a good miner, he would not refuse her to me; and he kept his word.

The day that I became a cutter, he laid his hands on us and blessed us as a betrothed couple, and within a few weeks after that I led her as my wife up to my chamber. That same day that I became a cutter, I struck a rich vein in the morning shift while still a cutter's apprentice, just at sunrise. The duke sent me a golden chain with his likeness as a large coin, and promised me the place of my father in law. How happy I was when I could hang it on my bride's neck on the wedding day and every eye was turned upon her. The old father lived to see several likely grandchildren, and

the luck of his autumn was richer than he had looked for. He could end his shift with joy, and go out of the dark mine of this world, to rest in peace and wait for the great pay day.

Sir, said the old man, as he turned towards Henry, and dried his eyes, it must be that mining is blest by God! For there is no art that makes its followers luckier, that more awakens faith in a heavenly wisdom and care, and keeps the heart more purely guiltless and childlike. The miner is born poor, and poor he goes to his grave. He is satisfied to know where the metallic powers are found and to bring them to light; but their dazzling splendor has no power over his pure heart. Unkindled by dangerous madness he rejoices more over their wonderful shapes and the strangeness of their source, and their resting place is than over owning them with their unbounded promises. They have for him no charms any more when they have become merchandise, and he seeks them amid a thousand dangers and hardships in the fortresses of the earth, rather than follow their call into the world and strive after them on the surface of the ground with cheating and cunning arts. Those hardships keep his heart fresh and his mind strong; he enjoys his scanty wages with [illegible] thankfulness and comes up every day with renewed enjoyment of life out of the dark caverns of his calling. He alone knows the charm of light and rest, the goodness of the free air and of a wide outlook, to him alone do food and drink taste [illegible] refreshing and devout, as it were the body of his Lord; and with loving and tender feelings does he walk among his peers, or cheer his wife and children and thankfully delight himself with the fair gift of familiar talk!

His lonely business keeps him a great part of his life away from daylight and from fellowship with men. He does not accustom himself to a dull lack of feeling towards these lofty, deepening things, and he keeps the childlike frame of mind in which everything shows itself to him with its own spirit and in its first bright colored wondrousness. Nature does not wish to be owned solely by one man. As a thing owned she changes herself into a bad poison that scares away rest, and brings on the ruinous lust to draw everything into the circle of the holder, and with it she brings an endless train of cares and wild passions. So she secretly undermines the groundwork of the owner, and buries him soon in the yawning gulf, that the man go from hand to hand, and little by little satisfy [illegible] to belong to everybody.

On the other hand how quietly the miner works in his deep solitudes far away from the restless ~~uproar~~ hubbub of day, and only quickened to harmony by thirst for knowledge and by love. He thinks in his loneliness of his comrades and their families with hearty goodwill, and feels ever anew the needfulness of men one to another and their kinship. His calling teaches him untiring patience, and does not allow his mind to lose itself in useless thoughts. He has to deal with a wonderfully hard and unyielding power, that is to be overcome only by stubborn industry and steadfast watchfulness. But what a rare growth blooms for him in these awful depths, real trust in his heavenly father, whose hand and forethought are shown to him every day by unmistakable signs. How many countless times have I not sat in the mine at the fire, and by the light of my lamp looked on the homely crucifix with the heartiest devoutness! There did I first rightly take in the holy meaning of this mysterious image, and often up the richest vein of my heart, ~~are~~ that has yielded me ~~an~~ lasting gains.

The old man went on after a while, and said: Truly that must have been a god'little man who first taught men the noble art of mining, and did in the bosom of the rocks this picture of human life. Here the vein is thick and crumbling, but poor; there the rock pinches it into a wretched, thrifting cleft, and ~~the~~ just here the richest ores are struck. Other veins lessen its richness, until a kindred vein kindly joins it, and raises its worth immeasurably. Often it splits up ~~into~~ before the miner into a thousand strings; but full of patience he does not ~~let~~ himself be frightened, he keeps quietly on his way and sees his zeal rewarded when he discovers it soon again in new thickness and kindliness. Often a treacherous leader entices him out of the true course; but soon he knows the way is wrong, and he drives right across by main force until he has found ~~again~~ the true orebearing vein again. How well the miner learns here to know all the ~~every~~ humors of chance, but how surely also the fact that zeal and steadfastness are the only unfailing means to master them, and to wrest from them the stubbornly guarded treasure.

Of course, said Henry, you have no lack of enlivening songs. I would say rather, that your calling must stir you up to singing in spite of yourself, and music must be a welcome companion to miners.

You have spoken the truth there, answered the old man; singing and cittern playing belong to the life of the miner, and no rank

in life can enjoy their charms with more pleasure than ours does. Music and dancing are real joys for the miner; they are like a cheerful prayer, and looking back on it and forward to it help to lighten and shorten the long loneliness.

If you please, I will treat you forthwith to a song that was much sung in my youth.

Him who Earth's depths doth measure
She doth as lord revere;
Who findeth only pleasure
Within her bosom dear;

*

Who, at her stone limbs peering,
Their hidden plan doth know,
And downwards all unfearing
Doth to her workshop go.

*

He is with her united
And heartily allied;
She hath his love excited,
As if she were a bride.

*

He looketh on her daily
With love renewing zest,
And busieth him gaily;
She leaveth him no rest.

*

She favoreth him greatly,
And doth him kindly show
The story grand and stately
Of ages long ago.

*

Upon his face is streaming
The air of early time,
And through the dark clefts beaming
A deathless light sublime.

*

Hoever in his courses
Busieth well known land,
And gladly help her forces
The working of his hand.

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Him will the waters follow
Right helpful up the hill;
To him each rock closed hollow
Its treasure open will.

*

To the king's house he letteth
A golden flood pour down;
With noble gems he setteth
Full many a kingly crown.

*

True to the king he reacheth
His gifted hand, be sure;
Yet small return beseecheth
And joyful liveth poor.

*

On plains in purple fountains
Blood gusheth for reward;
He still is on the mountains
The world's lighthearted lord."

---

*A more republican form of the two last verses but one would be:

Unto the state he letteth
A flood of riches down;
As if with gems, he setteth
The land with many a town.

*

True to the state he reacheth
His gifted hand, be sure;
Yet small return beseecheth
And joyful liveth poor.] — Translator.

The song pleased Henry highly, and he begged the old man to give him still another. The old man was willing, too, and said: "I know, sure enough, another wonderful song, that comes we do not know whence from.

A travelling miner brought it to us; he came from a great way off, and was a remarkable user of the divining rod. The [illegible]

*

Hein will te wahre gellow
Light helpful up te hill;
To him each each closed hollow
Is treasure open will.

*

To te lungs house he lettest
A golden flood pour down;
With noble gems he settest
Full many a kingly crown.

*

Tree t te king he reaselest
His gifted hand, be sure;
Yet small return beseeclest
And joyful livest poor.

*

On plains in purple fountains
Blood gusteth for reward;
He still is on the mountains
The worship lightheartest lord."

---

* A more republican form of the two last verses but one would be:

Unto te state he lettest
A flood of riches down;
As if with gems he settest
Te land with many a town.

*

Tree t te state he reaselest
His gifted hand, be sure;
Yet small return beseeclest
And joyful livest poor.] — Translator.

The song pleased Henry highly, and he begged the old man to give him still another. The old man was willing, so, and sin[illegible] [illegible], [illegible] [illegible], [illegible] wonderful song, that comes we do [illegible] [illegible] from.

A [illegible] [illegible] [illegible] [illegible]; he came from a great way [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

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much, because it sounded so strangely, almost as dark and hard to understand as the music itself, but for that very reason drew us so beyond measure, and in waking hours entertained like a dream.

[illegible] strong;
[illegible] towers
Abodes [illegible] with a wondrous throng,
And never [illegible] surmounts his towers.
Nine hidden is his pleasure hall,
That [illegible] gardens are safely keeping;
There only [illegible] fountains sweeping
Down from the mottled roof do fall.

*

Whatever [illegible] did view
[illegible]
They gave him [illegible] report and true,
And [illegible] of [illegible] narrations.
He [illegible] himself within their flood,
[illegible] so tender,
And bright his [illegible] shine forth with splendor,
Out from his mother's clear white blood.

*

Old is his castle, strange and rare;
It sunk down, out of deep rare falling
Stood firm, and stands [illegible]
[illegible] the heavens forestalling.
From thence around his subjects all
A [illegible] bond is lying;
And [illegible] little conquering flags are flying
Adown the lofty rocky built wall.

*

A vast, immeasurable [illegible]
Around the fast [illegible];
Each fills a faithful [illegible]
And with sweet words his [illegible].
They long to him good luck [illegible],
[illegible] dream not that they have [illegible];
By blinding fondness still [illegible],
[illegible] yoke they have not known.

19

11

But few are crafty and awake,
And never for his gifts are pining;
Unceasingly they undertake
The ancient castle's undermining.
[illegible] hands alone can take away
The deep old curse of resting hidden;
If once laid bare the halls forbidden,
Then dawns the light of Fredom's day.

•

The busy find no wall too high,
The brave go down the deepest hollow;
Who on their heart and hand rely
Upon the king's track promptly follow.
Him from his chambers forth they throw,
[illegible] spooks they chase with others faster,
The raging floods they fully master,
And make them [illegible].

*

The more he now comes forth to sight,
And madly round the earth he charges;
The more is closely curbed his might,
The [illegible] of the free enlarges.
At length through empty deep [illegible],
From every hindrance freed, the ocean,
And bear us with green wings soft motion
[illegible] of our house.

It seemed to Henry, when the old man had ended [illegible] if he had already heard the song somewhere. He got him to go over it again and wrote it down. After that the old man went out, and the merchants talked with the other guests in the mean time of the uses of mining and its hardships. One said: The old man, you may be sure is not here for nothing. He clambered about among the hills today, and has no doubt found good signs. Let's ask him, when he comes in again. Do you know, said another, we could ask him to find water for our village? The water now is a longer off, and a good well would be very welcome to us. It comes into my head said a third, that I might ask him to take along with him my son that has filled the whole house full of stones. The boy is sure of making a skilful miner, and the old man [illegible]

[Continued on next page [illegible], p. [illegible]]

*

*

135 South Fifth Street, Philadelphia,
5th March, 1869.

W. S. Laird Esq.
Willow West above Broad.

Dear Sir,

Please send me as early tomorrow morning as you can half a ton of Lorberry Coal [illegible] size, or coal as near like that as may be, and oblige

Yours respectfully
Benj. Smith Lyman.

[Continued from the last page but one p. 252]

to be honest and sure to get something good out of him. The merchants are read if they could not perhaps start a paying traffic with Bohemia through the miner, and in that way get metals at good prices. The old man came into the room again, and they all wished themselves to avail of his acquaintance. He began by saying: How close and uncomfortable it is here in this little room, isn't it? The moon stands out there in full glory, and I have a great mind to take a walk yet. I have seen by daylight today some remarkable caves near here. Perhaps some of you will have a mind to go too; and if we only take lights with us, we can look about us inside there without trouble.

These caves were already known to the villagers; but until now none had ventured to go into them; they cheated themselves on the other hand with frightful stories of dragons and other monsters that dwelt there. Some maintained that they had themselves seen the caves, and averred that bones of men and animals that had been seized and eaten up were found at the entrance. Some others believed that a ghost dwelt there, for they had seen from a strange human form from a good ways off, and had heard singing at night from over there.

The old man seemed to give them no great faith, and assured them with a laugh that they could go along without fear under shelter of a miner, since the monsters must be afraid of him; but that a singing ghost was surely a good being. Love of novelty gave many courage enough to take up with his plan: Henry wished to go too, and his mother at last yielded to his prayers, when the old man had spoken to her, and had promised to take good care of Henry's safety. The merchants were of the like mind. Long pine splinters were gathered for torches, a part of the company furnished themselves even overmuch with ladders, poles, cords and every kind of safeguard; and so the pilgrimage to the neighboring hills began at length. The old man went in front with Henry and the merchants. The peasant had brought his knowledge loving son, who ~~took hold~~ full of joy took hold of a torch, and showed the way to the caves. The evening was fair and warm. The moon stood in mild brightness above the hills, and raised wonderful dreams in every creature. Just like a dream of the sun it lay over the inward looking dream world, and led all nature with its countless parts back into that fabulous early time, when every germ slumbered

yet by itself, and lonely and untouched longed in vain to unfold the dark fullness of its boundless life. Henry's feelings the tale of the evening was mirrored. ~~It was to him~~ as if the world rested all open within him, and showed him as a guest all her treasures and hidden delights. The great, simple show around him seemed so ~~simple~~ easy to understand. Nature seemed to him not to be fully taken in only for the reason that she piled up around men the nearest and and most familiar with such a lavishness of manifold utterance. The words of the old man had opened in him a tapestry hidden door. He saw his little dwelling chamber was built close to a lofty minster, out of whose stone floor the solemn ancient world rose up, while from the dome the bright, cheerful future in the form of golden angel children floated and sang before it. Mighty sounds trembled in the silvery singing, and all creatures went in at the wide doors, every one of whom clearly spoke out his inner nature in a simple prayer and in a tongue of his own. How amazed was he that this clear view, already so needful to his being, had so long been unknown to him. Now he scanned at once all his ties to the wide world around him; felt what he had become through it, and what it would become to him, and he quite took in all the strange notions and goodings that he had often traced in its looks. The merchants' story of the young man who studied nature so busily and became the king's son in law came again to his mind, and a thousand other things that he recalled in his past life of their own will tied themselves to a magic thread.

While Henry gave way to his thoughts, the company had come near to the cave. The entrance was low, and the old man took a torch and clambered over the stones into it the first. A pretty plainly felt stream of air met him, and the old man assured them that they could follow him without fear. The most faint hearted went last and kept their weapons in readiness. Henry and the merchants were behind the old man, and the boy walked delighted by his side. The way ran at first through a rather narrow passage, that soon ended however in a very wide and high cavern, which the torch ~~light were~~ could not ~~able~~ fully to light up ~~fully~~ still they saw in the background that some openings passed into the light into the rock wall. The ~~ground~~ floor was soft and pretty even; the walls as well as the roof were not rough nor uneven either; but

what chiefly caught the eyes of all was the countless number of bones and teeth that covered the ground. Many were quite well kept, on others you saw signs of rotting, and those that here and there stuck out of the wall seemed to have turned into stone. Most of them were of uncommon size and strength. The old man was much pleased at these relics of a very early age; the peasants alone did not feel quite right there, for they took them for ~~marks~~ traces of beasts of prey near at hand, no matter how clearly the old man showed them to be signs of ~~a time out of mind~~, and asked them if they had found any traces of havoc among their heads and of ~~preying upon~~ mischief to men of the neighbourhood, and if they could take these bones for the bones of any known beasts or of men? The old man was now for going further into the hill; but the peasants found it best to withdraw to the entrance of the cave and there await his return. Henry, the merchant and the boy kept with the old man, and furnished themselves with cords and torches. They soon came to a second cavern, where the old man did not forget to mark the passage out of which they had come by a figure of bones that he laid before it. The cavern was like the former one, and was just as rich in animal remains.

Henry was awestruck and full of wonder; it seemed to him as if he were wandering through the front courtyard of the inner earth palace. Heaven and earth lay all at once a great ways off, as it seemed to him, and these dark wide halls seemed to belong to a strange kingdom of the nether world. How, thought he to himself, could it be that a world by itself moved with a monstrous life ~~under~~ beneath our feet? That unheard of races had their being in the fortresses of the earth, whom the inner fire of the dark bosom swelled up to gigantic and great souled forms? What if some day these aweful strangers, driven forth by the incoming cold, should come among us, while perhaps at the same time heavenly guests, living, speaking powers of the constellations, should become seen over our heads? Are these bones relics of their wandering towards the surface, or signs of a flight into the depths?

[The party soon find a man loving hermit in the cave, and have a long talk with him. In the course of it he says to the Ch: miner:]

You must have travelled about a good deal then, and no doubt you have seen a great many remarkable things.

Our art forces us to look about a good deal on the surface of the earth, and it is as if a fire of the nether world drove the miner about. One mountain sends him to another. He is never done with seeing, and through his whole lifetime he has something to learn of that wonderful workmanship that has so strangely founded and inlaid the floor under our feet. Our art is very old and widely spread. It travelled perhaps like our race from the east with the sun towards the west, and from the middle towards the ends. It has everywhere had to deal with new hindrances, and as necessity ever stirs up man's wit to cunning inventions, the miner can everywhere add to his knowledge and skill, and enrich his home with useful experience.

You are almost the counterpart of the astrologer, said the hermit. If they study the heavens fixedly, and wander through its immeasurable spaces, you turn your eyes to the ground and search out its framework. They study the forces and influences of the constellations, and you reach into the forces of rocks and mountains and the manifold workings of earthy and stony layers. To them the heavens are a book of the future, while to you the earth is a monument of the early world.

This agreement is not without meaning, said the miner smiling. The shining prophets play perhaps a chief part in that old history of the wonderful building up of the earth. Perhaps they will be better known and understood in time from their works, and their works from them. Perhaps the great mountain chains show the traces of their former paths, and had even a mind to nourish themselves without help, and to go on their own way to heaven. Many raised themselves boldly enough, that they might become stars too, and must now for that reason do without the fair green clothing of lower places. They have got nothing in return, save making the weather for their fathers, and are prophets for the lower country that they now sweeten, now flood with thunderstorms.

Since I have dwelt in this cave, the hermit went on to say, I have learned to think more upon the olden time. Words cannot tell how taking this study is, and I can easily see the love that a miner must cherish for his trade. When I look

in the strange old times that swarmed here in such mighty numbers; when I think of the wild time [illegible] outlandish, monstrous beings swarmed into these caves in thick crowds, driven perhaps by fear and dread, and found here their death; when I remount to the times when these caves were closed up and vast floods covered the land; I seem to myself like a dreamer of the future, like a child of everlasting peace. How quiet and peaceable, how mild and bright by the side of those mighty, gigantic times is the nature of today! and the most frightful storm the most horrid earthquake in our day is only a feeble echo of those awful birth pangs. Perhaps to the world of plants and animals, yes, even the men of those times, if there were any on islands here and there in that ocean, had a stronger, rougher build, — at least the old stories of a race of giants then ought not to be taxed with being a mere fiction.

It is pleasing, said the old man, to remark that quieting down of Nature step by step. A more and more humane understanding, a more peaceful agreement, a mutual upholding and quickening seem to have grown up little by little, and we come to better and better times. It might well be that now and then some of the old leaven worked yet, and that some heavy quakings followed; nevertheless you can see the all powerful striving for a freer, more harmonious state, and in this spirit every quaking will pass by and lead nearer to the great end. It may be that nature is no longer so fruitful, that today no metals nor precious stones, no rocks nor mountains take their rise; the more her power to create has been used up, the more her shaping, unfolding and social powers have grown, her heart has become softer and tenderer, her fancy more manifold and symbolical, her hand lighter and more skilful. She comes nearer to man, and if she was formerly a game bearing [illegible], she is now as still, a flowering plant, a dumb, manlike artist. And for what would it be needed to gain more of those treasures, which are already more than enough for untold ages. How small is the space that I have travelled through, and what mighty stores have I not found at the very first glance, the using of which is left for after times. What riches do not the mountains of the north shut in, what promising signs did I not find everywhere in my native country, in Hungary, at the foot of the Carpathian mountains and in the rocky valleys of the Tyrol, Austrian and

Bavaria. I could be a rich man, if I could have carried with me what I had only to pick up or to knock off. In many places I looked around me as if in a magic garden. What I saw was formed of the costliest metals and most skilfully. In the beautiful hairs and sprays of silver hung shining ruby red transparent fruits, and the heavy trees stood on a crystal ground that was worked up in quite inimitably. You scarcely trusted your senses in these wonderful places and were never tired of wandering through these shimmering wildernesses, and of delighting in their jewels. In the journey of mine now I have seen many remarkable things too, and surely the earth is in other countries quite as richly gilding and lavish.

There is no doubt of that, said the unknown, if you think of the treasures that have their home in the east; and have not the far Indies, Africa and Spain been known even in ancient times for the riches of their soil? A warrior to be sure does not give close heed to veins and clefts in the mountains, but nevertheless I have sometimes had my thought about these shining streaks that like strange hints point to an unlocked for treasure and fruit. How could I then have thought, as I gaily passed in the light of day these dark dwelling places, that I should yet end my days in the bosom of a mountain.

185 South Fifth Street, Philadelphia;
8 March, 1869.

To E. B. H.
Ledger Office.

Sir:

Mrs. Charlotte Kennard has noticed your advertisement in the Ledger for "a woman and wife without children to keep and clean and make fires," and thinks that she and her son, who is twenty one years old, might answer your purpose. She is a strong worthy widow woman, has lived for many years in this building, is thoroughly honest and very neat and painstaking in the care of offices, and is quiet, good natured and bright. Her son likewise is quite trustworthy, active, handy and bright and has had experience in the care of offices. Her only other child is a daughter sixteen or seventeen years old who is a help to her mother in her work.

Respectfully yours.
Benj. Smith Lyman

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Der ist der Herr der Erde,
Wer ihre Tiefen misst,
Und jeglichen Beschwerde
In ihrem Schooss vergisst.

*

Wer ihrer Felsengründer
Geheimen Bau versteht,
Und unverdrossen nieder
Zu ihrer Werkstatt geht.

*

Er ist mit ihr verbunden,
Und inniglich vertraut,
Und wird von ihr entzunden
Als wär' sie seine Braut.

*

Er sieht ihr alle Tage
Mit neuer Liebe zu,
Und scheut nicht Fleiss noch Plage,
Sie lässt ihm keine Ruh.

*

Die manchfaltigen Geschichten
Der längst verflossnen Zeit
Ist sie ihm zu berichten
Mit Freundlichkeit bereit.

*

Der Vorwelt heil'ge Lüfte
Umwehn sein Angesicht,
Und in die Nacht der Klüfte
Strahlt ihm ein ewges Licht.

*

Erstrifft auf allen Wegen
Ein wohlbekanntes Land,
Und gern kommt sie entgegen
Den Werken seiner Hand.

*

Ihm folgen die Gewässer
Hilfreich den Berg hinauf;
Und alle Felsenschlösser
Thun ihre Schätze ihm auf.

*

Er führt des Goldes Ströme
In seines Königs Haus,
Und schmückt die Diademe
Mit edlen Steinen aus.

*

Zwar reicht er treu dem König
Den glückbegabten Arm,
Doch fragt er nach ihm wenig,
Und bleibt mit Freuden arm.

*

Sie mögen sich erwürgen
Am Fuss um Gut und Geld;
Er bleibt auf den Gebirgen
Der frohe Herr der Welt.

*

Der ist der Herr der Erde,
Wer ihre tiefen misst,
Und jeglicher Beschwerde
In ihrem Schooss vergisst.

*

Wer ihrer Felsenglieder
Geheimen Bau versteht,
Und unverdrossen nieder
Zu ihrer Werkstatt geht.

*

Er ist mit ihr verbündet,
Und innigliche vertraut,
Und wird von ihr entzündet
Als waer sie eine Braut.

*

Er sieht ihr alle Tage
Mit neuerlich zu;
Und scheut nicht Fleiss noch Plage,
Sie lässt ihm keine Ruh.

*

Die maechtigen Geschichten
Der laengst verflossnen Zeit
Ist sie ihm zu berichten
Mit Freundlichkeit bereit.

*

Der Vorwelt heil'ge Luefte
Umwehn sein Angesicht,
Und in die Nacht der Kluefte
Strahlt ihm ein ewges Licht.

*

Er trifft auf allen Wegen
Ein wohlbekanntes Land,
Und gern kommt sie entgegen
Den Werken seiner Hand.

*

Ihm folgen die Gewaesser
Hilfreich den Berg hinauf;
Und alle Felsenschlosser
Thun ihre Schaetze ihm auf.

Er führt des Goldes Ströme
In seines Konigs Haus,
Und schmuckt die Diademe
Mit edlen Steinen aus.

*

Zwar reicht er treu dem Konig
Den gluecksbegabten Arm,
Doch fragt er nach ihm wenig,
Und bleibt mit Freuden arm.

*

Sie mögen sich erwuergen
Am Fuss um Gut und Geld;
Er bleibt auf den Gebirgen
Der frohe Herr der Welt.

*

Ich kenne wo ein festes Schloss;
Ein stiller Koenig wohnt darinnen,
Mit einem wunderlichen Tross;
Doch steigt er nie auf seine Zinnen.
Verborgen ist sein Lustgemach,
Und unsichtbare Waechter lauschen;
Nur wohlbekannte Quellen rauschen
Zu ihm herab vom bunten Dach.

*

Was ihre hellen Augen sahen
In der Gestirne weiten Saelen,
Das sagen sie ihm treulich an,
Und koennen sich nicht satt erzaehlen.
Er badet sich in ihrer Flut;
Waescht sachte seine zarten Glieder,
Und seine Strahlen blinken wieder
Aus seiner Mutter weissem Blut.

*

Sein Schloss ist alt und wunderbar,
Es sank herab aus tiefen Meeren,
Stand fest und steht noch immerdar,
Die Flucht zum Himmel zu verwehren;
Von innen schlingt ein heimlich Band
Sich um des Reiches Unterthanen,
Und Wolken wehn wie Siegesfahnen
Herunter von der Felsen wand.

***

Ein unermessliches Geschlecht
Umgiebt die fest verschlossnen Pforten;
Ein jeder spielt den treuen Knecht,
Und ruft den Herrn mit süssen Worten.
Sie fuehlen sich durch ihn beglueckt,
Und ahnden nicht, dass sie gefangen;
Berauscht von traeglichem Verlangen
Weiss keiner, wo der Schuh ihn druckt.

*

[illegible] kennt wo ein festes Schlosse;
[illegible] stiller Koenig wohnt darinnen,
[illegible] einem wunderlichen Tross;
[illegible] steigt er nie auf seine Zinnen.
[illegible] Morgen ist sein Lustgemach,
[illegible] unsichtbare Wächter lauschen;
[illegible] wohlbekannte Quellen rauschen
[illegible] herab vom bunten Dach.

*

[illegible] ihre hellen Augen [illegible]
[illegible] der Gestirne weiten Seelen,
[illegible] sagen sie ihm treulich an,
[illegible] Koennen sich nicht selt erzählen.
[illegible] badet sich in ihrer Flut;
[illegible] seine zarten Glieder,
[illegible] blinken wieder
[illegible] Blut.

*

Sein Schloss ist alt und wunderbar,
[illegible] herab aus tiefen Meeren,
[illegible] fest und [illegible]
Die Flucht zum Himmel zu verwehren;
[illegible] schlingt [illegible] Band
Sich um des Reiches [illegible],
Und Wolken [illegible] Siegesfahnen
[illegible] vom der Felsen wand.

**

Ein unermesslicher Geschlecht
[illegible] die fest verschlossenen Pforten;
Ein jeder spielt den treuen Knecht,
Und ruft den Herrn mit süssen Worten.
[illegible] fühlen sich durch ihn beglückt,
Und ahnden nicht, dass sie gefangen;
Berauscht von trüglichem Verlangen
Weiss keiner, wo der Schuh ihn drückt.

*

Nur wenige sind schlau und wach,
Und dürsten nicht nach seinen Gaben;
Sie trachten unablaessig nach,
Das alte Schloss zu untergraben.
Der Heimlichkeit ur mächtgen Bann,
Kann nur die Hand der Einsicht lösen;
Gelingts, das Innre zu entbloessen:
So bricht der Tag der Freiheit an.

*

Dem Fleiss ist keine Wand zu fest,
Dem Muth kein Abgrund unzugaenglich;
Wer sich auf Herz und Hand verlaesst,
Spuert nach dem Koenig unbedenklich.
Aus seinen Kammern holt er ihn,
Vertreibt die Geister durch die Geister,
Macht sich der wilden Fluthen Meister,
Und heisst sie selbst heraus sich ziehen.

*

Je mehr er nun zum Vorschein koemmt,
Und wild wunder sich treibt auf Erden;
Je mehr wird seine Macht gedaemmt,
Je mehr die Zahl der Freien werden.
Am Ende wird, von Banden los,
Das Meer die Eliere Burg durchdringen,
Und trägt auf weichen gruenen Schwingen
Zurueck uns in der Heimath Schooss.

*

*

To the Commissioner of Patents:

The petition of Benjamin Smith Lyman, of Philadelphia, in the County of Philadelphia and State of Pennsylvania,

Respectfully represents:

That he has made certain improvements in the way of making iron and steel from the ore; and that he wishes for time to make certain experiments in order to perfect the same, before applying for letters patent therefor. He therefore prays that the underwritten account of his invention may be filed as a caveat in the confidential archives of the Patent Office, agreeably to the provisions of the Act of Congress in that case made and provided; he having paid [illegible] dollars into the treasury of the United States, and otherwise complied with requirements of the said act.

Philadelphia, 18 March, 1869.
[Dated some days after written]

A [illegible] to make Iron and Steel from the ore.

In order to make more clear the new way of making iron and steel from the ore, it will be well to recall some of the main points in the common process of the high stack furnace. The ore in such a furnace passes through four main stages. 1°. In the first stage the heat does not [illegible] above 400° Centigrade, and the ore and fuel merely [illegible]

dried and the ore more or less cracked and broken up. 2° In the second stage the heat reaches to 1000° or 1200° Centigrade, bright red, and the ore is reduced from peroxide to magnetic oxide, and from magnetic oxide to metallic iron. 3° In the third stage the heat rises to 1600° Centigrade and the ore begins to be carburetted and to soften or become pasty. 4° In the fourth stage that only the iron melts, but the earthy matters combine with the flux and melt too.

In the new way of making iron and steel there are separate chambers for some of these stages. 1° One chamber is used for drying and roasting the ore. This chamber is square cornered, and has within it several rows of long narrow

shelves, each shelf running the whole length of the chamber and having in consecution a double slope on top like the letter A, and being movable in a swinging way on an axis that runs lengthwise of the shelf. The shelf may be made of fireclay burnt. The shelves are by their axes all connected together and connected with a little very simple clockwork and a pendulum, by which they are all kept in motion, shaking back and forth, moving through a small arc backwards and forwards on their axes. The motion is given to the pendulum and clockwork by a weight that must be wound up from time to

Vessel through which the chamber is a compartment separated from the by a [illegible] hopper like openings answering [illegible] and [illegible] flanged at the or in a [illegible] [illegible] [illegible] to by it little by little [illegible] the [illegible] below, and be driven from a flame on the [illegible] above, and [illegible] by keep all the way the [illegible] the [illegible] [illegible] [illegible] for it [illegible]. It time taken up by the air in passing from the by the chamber to the bottom, [illegible] [illegible] by the [illegible] the chamber, but by the [illegible] of [illegible], by the [illegible] of the [illegible], by the amount of air in motion, and by the pressure of steam. This [illegible] [illegible] is [illegible], regulated by [illegible] of [illegible] [illegible]. [illegible] by of the Cut-off, and the [illegible] into the chamber at; [illegible] [illegible] and will [illegible] at the [illegible], and if will not by the [illegible] the [illegible] will thoroughly [illegible] it, and [illegible] the [illegible] [illegible] [illegible]

2° The [illegible] Retorting gallows which [illegible] [illegible] [illegible] [illegible] to the [illegible] of another chamber after [illegible]. The removal may either be made by [illegible] [illegible] field Chamber be [illegible] [illegible] from [illegible] [illegible] by [illegible] [illegible] [illegible] other. At the [illegible] [illegible] Chamber is to be in a vitreous state, heated [illegible] to [illegible] Cardigan. He or in using a [illegible] [illegible] and pulling from one [illegible] [illegible] [illegible] [illegible]

and then it be melted, either as soft iron, or as steel, or as cast iron as may be preferred, but with care not to expose it to the air. In order to help the melting, as soft iron is very hard to melt, a certain well-ascertained amount of powdered charcoal should be [illegible] fine or [illegible] of the second chamber. This [illegible] chamber becomes well [illegible] with [illegible] amount, gives rise to steel or to cast iron in melting. The earthy matters will float out of when the iron melts; but, if it be desired to separate them more thoroughly by the help of a flux, unslacked lime in powder may be [illegible] with the ore at the top of the second chamber. The reverberatory furnace may be heated by the burning of [illegible] in the way invented by Siemens.

With very pure ores the first, or wasting, chamber would not be needed, the fine or [illegible] feed, to start with, into the second or [illegible] chamber, and would be [illegible] dried and deoxydised there.

The advantages claimed for this way [illegible] iron and still are.

1° Saving: a, In the first outlay, since the chambers may be made [illegible]. — b, In labor, as the ore in the chambers almost takes care of itself, and the fuel has not to be [illegible] a high stack furnace, and in general little labor is needed. — c, In fuel; for a poor quality of fuel can be used in making the [illegible]

[illegible] and [illegible] [illegible] [illegible] used throughout.

2° Ease and certainty in regulating the whole work. The movement of the ore and the [illegible] of each chamber can be [illegible] and [illegible] controlled, so as to give uniformly the [illegible] for.

The advantages are especially great where the ore is already in a state of [illegible], unfit for the high stack furnace, where only a [illegible] [illegible] can be got, as in the Rocky Mountain Region [illegible] [illegible] [illegible] furnace.

It is not claimed that any single part of the apparatus or process is [illegible], [illegible] the application of a chamber with [illegible] [illegible] to the [illegible] of ore with the help of carbonic oxide, [illegible] [illegible] that this and the general combination of the [illegible] [illegible] of the process and such apparatus as mentioned are new.

[Date added several days after writing]

Philadelphia, 16 March, 1869. Benj. Smith [illegible].

City and County of Philadelphia,
State of Pennsylvania, ss:

On this day of 186 , before me, the subscriber an [illegible] of the city personally appeared the within named Benjamin Smith [illegible] and made solemn oath that he verily believes himself to be the original and first inventor of the mode herein described of making iron and steel from the ore, and that he does not know or believe the same was ever before [illegible] or used; and that he is a citizen of the United States.

[Written, 12 March, 1869.]

135 South Fifth Street, Philadelphia; 12 March, 1869.

Prof. Raymond Esq.

Editor of the Am. Journal of Mining

My dear Sir:

I send you herewith in five envelopes a translation of an extract from Novalis on the [illegible], thinking that if [illegible] are [illegible] to give the space for it in your journal, it would interest [illegible] good number of [illegible] readers and perhaps add a [illegible] to their [illegible] price. The price is certainly an interesting one [illegible] and the translation is [illegible] pretty literal one.

Of course you will have to publish it, if at all, in several parts; at the fewer, the better. If you should make but [illegible] parts, it would [illegible] to divide it at the end of the first song; if you make three [illegible] of it, another good place to divide it would be at the break nearest [illegible] to the end of the first song is an extract [illegible] German Reader; if you must make four [illegible] be divided again at the first [illegible] on page 12, [illegible] a short one, scarcely anything [illegible] second [illegible] seems likely to make seven or eight columns of [illegible] each.

[illegible] of course [illegible] of what [illegible] into your journal, [illegible] of what shall come out under [illegible]. To please do not make any changes in the manuscript [illegible] summer), without special permission, except [illegible] misprints. If you have any alterations to [illegible] they will [illegible] listened to; and if you prefer on the whole to reject the [illegible] you are of course at liberty to do so.

The original German of the songs is sent with the translation, as [illegible] to print them in the editorial columns in continuation [illegible] songs begun last year. If so, please put each [illegible] in the number in which its translation is printed.

Please send me seven extra copies of each number in which the translation is [illegible]. Believe me ever very truly yours. Benj. [illegible] Lyman.

135 South Fifth Street, Philadelphia; 12 March, 1869.

Edward R. Hawley.
Pomeroy, Ohio.

Dear Edward:

Your favor of the twenty-fifth of last month came to and on the second of this; and that same day I sent you by express as requested the Taylor's Statistics, The Urbin and Aystrom, and the next morning sent a letter by mail. As no acknowledgment has yet [illegible] from you, it seems likely either that the package or letter or [illegible] have miscarried, or, what is more likely, that your answer has gone astray. Fearing that you [illegible] in your letter instead of a post office money order as you had intended, and that it has been stolen, I have thought it worth while to drop [illegible] line without waiting any longer.

The [illegible] are all well, just now. Hoping that you are so too, and as lucky as ever, I remain

Very truly yours.

Benj. Smith Lyman.

[illegible]

[illegible]

[illegible]

135 S. 3d Fifth Street, Philadelphia; 13 March, 1869.

Edward R. Howe Esq.
Pomeroy, Ohio.

Dear Edward:

Your favor of the eighth is this morning at hand, with its enclosure of Six dollars for which I thank you. It was not postmarked until the tenth and that partly accounts for its not getting [illegible] but my letter took longer to reach you than I had expected. I hope this will reach you as soon as the one I took last night will, so that you will [illegible] made arrangements as to the [illegible] of your letter [illegible] to write again expressly about it. Perhaps you do not have a daily mail at Pomeroy; I had not thought of that, for the place seems to be one of some importance.

I will see if I cannot send you a newspaper from here now and then [illegible] you wrote the changes in the Cabinet have been important. Judge Hoar is a very strong man, and it is a pity that he should seem likely to leave it before long. There are intimations that [illegible] will be made Judge of the U. S. Supreme Court, but one paper yesterday said he was to go as minister to England. They say that Anthony Smith (my next door office neighbor), brother-in-law of Mr. McCulloch, is to be District Attorney here. You know it was at his house that Mrs. Lady dined with [illegible] last January.

With best wishes Affectionately yours.
Benj. Smith Lyman.

135 South Fifth Street, Philadelphia, 15 March, 1869.

[illegible]:

Your favor of the tenth came duly to hand, and I was [illegible] that the second examination of [illegible] proved so [illegible] that he is now in a fair way to be thoroughly [illegible]. — I was very much surprised at seeing Lucius Clark's death in the papers [illegible] I know I take the weekly [illegible]. He and his [illegible] pretty near together. I hope that some [illegible] was made at length for [illegible]; but if his affairs [illegible] are in such doubtful state, there is [illegible] to say nothing of [illegible] and [illegible] — I have not yet finally decided about Pottsville, but expect to do so [illegible] in a few weeks [illegible]. I do not care very much at any rate to go up there until the [illegible] of [illegible], at least two or three weeks [illegible] from [illegible] some out-of-door work there that I should wish to do [illegible] surveying I did there six years ago. [illegible] at any rate to carry on this [illegible] work if it should turn up, without at all giving [illegible]. But steady occupation up there seems to imply the necessity of giving up this office somewhat.

There is not much going on here to write about. I go to the Academy meetings every Tuesday evening, to the American Philosophical Society meetings on the first and third Friday evenings of each month, to the Franklin Institute meetings on the third Wednesday of each month, to Professor Frazer's house almost every ~~Friday~~ Tuesday evening, to [illegible] about every other Wednesday evening, and to the German Class every Saturday evening or so; and have therefore Monday, Thursday and [illegible] evenings left for visiting elsewhere or staying at home. The meetings of the German Class have been quite small of late, even when I have been going to them with one exception. The two last were at Mrs. White's and one before that at Miss Packer's. At the last but one Miss Helen Towne was there, of the family that are such friends of Mr. Lesley and that they met in Europe. This young lady was about seventeen years old when [illegible] and Fanny were here three years ago, and then in rather a transition state. The Townes had us all there one evening then.

[illegible], she has unfolded and is quite an attractive young woman. She is good looking though not of faultless beauty by any means, but has those pleasing manners that make even the homely beautiful and double the beauty of those that are already handsome. Her mother is said to be a woman of very good manners and this girl must have been in Europe just at the right time to catch something of the good manners that are so common there on the Continent. Her brother was one of the boys in Mr. Short's School when I taught there a dozen years ago, but is now married, and has just gone to live at Stamford, Connecticut, where he is engaged with others in the manufacture of locks. This sister of his seems to have picked up some knowledge of German, and talked pretty well, although she had not been long in Germany. She came that evening for the first time to the Class and was not there again last week! At the last meeting Saturday evening, were have over Miss Bachmann, a lady from Boston, who teaches French in Miss Watson's School, but [illegible] German at the meeting, rather against her taste, for she speaks French very much; and Mrs. Helen McKenzie, whose husband [illegible] of the Press newspaper [illegible] unmarried [illegible] these two last are Germans from Wirtemberg, and at the first meeting that I met them three or four weeks ago [illegible] between them so as to be forced to talk German. Mrs. McKenzie is very bright, uncommonly so for a German but as she went away from me [illegible] to talk with Miss Watson on the other side of the room I applied myself to the unmarried [illegible] and chatted with her almost the whole evening. These ladies are so good natured as not to feel annoyed at the frequent blunders in the use of the German language, so it gives a fine chance to practice. At the end of the meeting I waited upon these two sisters home taking Miss Bachmann along at the same time; the night was warm and fair and we walked instead of taking a horse car. — Yesterday morning, Mrs. Hopper was so kind as to send me word by Isaac that her mother Mrs. Mott was to be at meeting that morning; so I went there, and had the pleasure of hearing her speak. She spoke better and with more life than I ever heard her before; but I have never heard her more than two or three times before. She is certainly a very extraordinary woman. She had her birthday a few weeks ago, and was seventy six. She spoke that day in meeting but I did not [illegible] it until the next day.

Give my love to all. Aunt [illegible] is [illegible] well with headache, but [illegible] well. [illegible] application [illegible] Daniel [illegible]

135 South Fifth Street, Philadelphia;
15 March, 1869.

Dear Koenig:

I left for you at your house this evening a number of the Manufacturer and Builder, but forgot to mark in it what I wanted you particularly to look at. That was a short article on the "Utilization of Tin Scraps". I only noticed it after you were here last, and thought it might possibly interest you. You can keep it just as long as you like; there is no hurry at all about returning it.

Very truly yours.

Benj. Smith Lyman.

[illegible] Street, Philadelphia;
15 March, 1869.

Dear Henry:

Left for your [illegible] [illegible] evening a number of the Manufacturer and Builder, [illegible] [illegible] in [illegible] [illegible] you particularly [illegible]. [illegible] a short article on the "Utilization of Tin Scraps". Lately noticed it after you were here last, and thought it might possibly interest you. You can keep it just as long as you like; there is no hurry about [illegible] turning it.

Very truly yours.

Benj: Smith Lyman.

135 South Fifth Street, Philadelphia, 15 Mar. 1869.

R. W. Raymond Esq.
Editor of the Amer. Jour. of Mining.
New York.

Dear Sir:

Your favor of the thirteenth is this morning at hand. You were right in quarrying that Novalis was not answerable for the title "Cavities of Mining"; but title was simply "Fünfter Kapitel". I do not object to the title "Underground" that you suggest. I did not look for anything but a short [illegible] wild, unpretending (fancy if you will) title that would give a pretty [illegible] idea of the subject treated of. I have also no objections to your [illegible] out the [illegible] you spend of; nor to your putting "dump pile" in the place of "tip heap", if you think it a commoner word. I confess that I am not so familiar with some technical words in English as in German and French; and [illegible] you can put something better in place of "Captain" [illegible]. But I have [illegible] and find it in a measure upheld by the dictionaries (Webster, and Dumpf & Mothes); and, though "dump pile" is less familiar to me, it would seem to me less peculiar to mining and would rather suggest railroad work. If the phrase "that comes we do not know where from" seems to you quite too [illegible] for [illegible] talk, you might change it to "and we ourselves do not know where it comes from!" — I hardly thought you would have leisure to suggest alterations, but thought you would choose to take or reject the whole in a lump. There is no doubt whatever that you could make many improvements in it; but I have [illegible] the slightest wish to take credit, as undeservedly, for [illegible] of style that you would add. If you think it worth while to do so, you may print the piece without my name to it, and then [illegible] as many changes in it as you choose. — I am sorry to have to disagree with you still about the phrase "Mining School," but still more sorry that your numerous readers can quote me as seemingly an [illegible] your views in the [illegible]. Any changes you made in my [illegible] last spring were either unnoticed by me or struck me as [illegible] [illegible] that one or quite unobjectionable; I do not remember.

— I cannot understand why the fourth and fifth envelopes did not come [illegible] with the [illegible] for they were all posted together. If they do not reach you, please [illegible] me know. — I am [illegible] dictionaries that "dump" is rather confined to the United States; how is that?

Very truly yours. [illegible] Lyman

[illegible] Street, Philadelphia, 17 March, [illegible]

Frances Wilson,
Editor of "Our Own",
701 Chestnut Street, Philadelphia.

Dear Madam:

Your favor of day before yesterday asking me for a scientific article is at hand, and I [illegible] also to thank you for a copy of first number of your magazines. I have nothing already [illegible] that would hardly be suitable; but, if I should have leisure, I might perhaps write something for you, and it would give me pleasure to do so.

Very respectfully yours.

Benj. Smith [illegible]

35 South Fifth Street, Philadelphia;
17 March, 1869.

My dear Miss Lyman:

It will give me great pleasure to accept your invitation to go with you to a reading at Mrs. Murray's to morrow evening. As you mention no time, I will be at your house about half past seven; since it may be necessary to reach Mrs. Murray's punctually by eight. If that hour is not right, please let me know.

Very truly yours.

Benj. Smith Lyman.

South Fifth Street, Philadelphia; 20 March, 1869.

A. Edwards Esq.

Montgomery, Ala.

Dear:

Your favor of the fifteenth of this month is at hand, asking whether I would make for you a geological examination of a tract of land near Montgomery with reference to graphite, and on what terms, and how soon.

I should be happy to undertake such an examination as you probably wish for, one that will get from the present exposures, natural and artificial, as good an idea of the value of the deposit as they will yield; and I will do it for two hundred dollars, if you will furnish me besides with the useful transportation and subsistence from the time of my arrival in Montgomery until the work is done, not many days it is likely. I will bear my own expenses from here to Montgomery and from there back again. But I must ask that one hundred dollars of that fee be paid before I leave here and the other hundred on my arrival in Montgomery. I have no engagement now that would keep me from going at short notice, say a week or perhaps even less; and I should like to go, if at all, as soon as possible on account of the coming warm weather.

Very respectfully yours.

Benj. Smith Lyman.

[illegible]

[illegible]

[illegible]

135 South Fifth Street, Philadelphia; 24 Mar 1839.

Felix Fournier Esq.
73 Boulevard St. Michel,
Paris.

My dear Sir:

Your welcome favor of the eighteenth of last month came [illegible]; and I was sorry to learn by it that I should not have the pleasure of seeing you so soon as I had expected. I am glad you think so favorably of Massachusetts as a place [illegible]. I think you will find the climate quite passable [illegible] for a month or two in the spring, when the [illegible] and [illegible] the coast especially, is very disagreeable. I confess, however, that the climate of some parts of the south, say among the mountains of Virginia or East Tennessee, is more attractive [illegible] the soil and scenery are also very fine; but society is still in a bad state there, and must for many [illegible] be far behind what New England is already. If you [illegible] spend a year in Canada you will find the climate there [illegible] than it is in Massachusetts, and for a few [illegible] quite as [illegible] (at Montreal). At Quebec and possibly at Montreal you will find a number of people who [illegible]; and you will find a little more respect for [illegible] feeling than is common in the United States; but in other respects it will hardly be anything like a [illegible] [illegible] this country to live for a while in Canada.

Personally, I know more about Halifax than any other city in the new Dominion of Canada; and I am sure that a Parisian would find [illegible] more comfortable [illegible] at home, in Boston or [illegible] [illegible] in Philadelphia than in Halifax. This is partly because Halifax [illegible] [illegible] of [illegible] 30,000 inhabitants. Still, Canada will before very many years be annexed to the United States more by their desire than ours, and may become in time a more agreeable place to live in, when it is still more thoroughly [illegible] in feeling. Already the interests of Nova Scotia, New Brunswick and part of Canada [illegible] them closer to the United States than to Great Britain. But we must be cautious about adding to our territory too fast and ought to let the apples rise [illegible] well before plucking them. Cuba seems likely to come to us soon, and Mexico before very long. It has long come natural to Americans to look forward to the time [illegible] not very far distant when the whole of North America will belong to the United States. So you see what you are coming to.

I think it likely that I may have to go to Alabama on [illegible] business within a week or two, and may be kept there some weeks possibly; but I hope to be in the North again by the time of your arrival. — It is very kind of you to offer to bring me books and the like; and if I should think of anything worth troubling you about I will make bold to let you know.

I have also to thank you very much for the excellent photograph of yourself that you enclose; and in return I send you mine.

I remain my dear Sir, as ever,

Yours very truly,

Benj. Smith Lyman

[illegible] was really astonishing, [illegible] Office Bookkeeper and the Clerks [illegible] that they really attend to [illegible] What may they [illegible] are women. [illegible] you [illegible] her speeches would be extraordinary [illegible] hymn book and it [illegible] Mrs [illegible] Hay, in commendation [illegible] Perkins [illegible] Perkins act. - This time, I did not [illegible] take the trouble [illegible] Miss Dyer [illegible] to go to Queen's Meeting [illegible], for I was [illegible] very much [illegible] had [illegible] before that Thursday [illegible]. She took me with her a week or two ago [illegible] to Dr Snyder of a private house, a neighbor of mine at [illegible] reading that [illegible] a Rat, Consumptive [illegible] Thursday [illegible] for his milk, and getting some money [illegible] in this way in [illegible] Los Gladiators who will [illegible] to kill us & [illegible] Mr Howells is a very poor reader [illegible] selections were [illegible] reading. She [illegible] has called a "Morning Call," which has [illegible] been; but Miss Dyer [illegible] would like it [illegible] at Cambridge. I [illegible] think it would be a good piece for [illegible] one of the Entertainments [illegible] as it is very witty and needs but [illegible] three actors at most and might easily be adapted for two, one [illegible] lady and one gentleman [illegible]; and there is some foreign [illegible] in it. [illegible] I believe I told you at [illegible] Mrs Lyman's [illegible] for a new Entertainment [illegible] reading of Miss Dewey. [illegible] Miss Dewey's cousin) and her Visit [illegible] last [illegible] surprised me [illegible] Tuesday morning by calling on me [illegible] at my [illegible] office. [illegible] It was [illegible] a surprise because she had [illegible] not [illegible] been, as [illegible] she had promised [illegible] to come [illegible] and [illegible] spend [illegible] the [illegible] day and [illegible] dine [illegible] with me [illegible] at home. [illegible] Mr Hayes [illegible] Tuesday evening [illegible] I went with pleasure, and [illegible] found [illegible] Miss Hallowell [illegible] there [illegible] whom I mentioned before (Old Probs) [illegible] as [illegible] was so much admired [illegible] "sending me to take a look at [illegible] Miss Dewey before [illegible] engagement [illegible] was [illegible] satisfactory [illegible] with [illegible] result, Mr & Miss Dewey [illegible] Mrs Hallowell [illegible] and [illegible] two [illegible]. Miss Hayes [illegible] entertained me by telling [illegible] of the [illegible] acting [illegible] before in private theatricals [illegible] at [illegible]

[illegible] the wedding [illegible]
[illegible] not [illegible]
[illegible]
[illegible] coming in [illegible] as an old woman from [illegible]
[illegible] and rattled [illegible]
[illegible]
[illegible] present. [illegible] were just about [illegible]
[illegible] and we [illegible] a little at [illegible]
[illegible] said [illegible] most of those who were at the theatre [illegible]
[illegible] This [illegible]
[illegible] evenings [illegible] belong to it [illegible]
[illegible], and Ellie Pitwell [illegible] urged to join it, [illegible]
[illegible] to [illegible] Philadelphia [illegible]
Ellie has not gone out much this winter. [illegible]
[illegible] but [illegible]
[illegible] with [illegible]
The German [illegible]
[illegible]
[illegible] very small [illegible] last week [illegible]
Susan [illegible] who is [illegible]
this evening [illegible] at [illegible]
lady and [illegible] Mrs. Pitwell [illegible] the German [illegible]
[illegible]
[illegible] German [illegible]
Mrs. M[illegible] [illegible] she is [illegible]
[illegible] as the [illegible]
very [illegible]

I [illegible] it very [illegible] I [illegible] have a [illegible]
work to do in [illegible] I [illegible]
in perhaps [illegible] I [illegible] prospect that [illegible]
work [illegible] I am glad of [illegible]
[illegible] for [illegible]
[illegible] and [illegible] it has [illegible]

Mr. Delano was here yesterday and night before [illegible]
well but in not so good [illegible] as he did when he was here [illegible]
or more ago, more [illegible] perhaps with his business affairs.
He had [illegible] came to my [illegible]
I first met him the evening before at [illegible] Susan's. [illegible]
[illegible]
[illegible]

[illegible]

[illegible] Sixth Street, Philadelphia, 29 March

Dear [illegible]

[illegible] favor of Thursday last [illegible] had found [illegible] his eyes, and I [illegible] they will now be quickly cured [illegible]. I am sorry to see an item this morning in the weekly Republican about him, [illegible] the trouble of his eyes. The Concert [illegible] send it [illegible] but it seems to me I have seen the [illegible] [illegible] in one of the same programs before; perhaps this was a revival. I suppose you are enjoying now your long expected visit [illegible]. I hear through Mrs. Jackson of Franklin [illegible] married to her cousin Miss Nellie Thayer in [illegible]. I had the honor of a call last Tuesday from Mrs. J[illegible] sister Mrs. Reed. They [illegible] to go to a [illegible] at their house [illegible]. I went and saw there their visitor Miss Helen Thayer [illegible] very bright young woman, and her and the Jacksons [illegible] Miss Deweys, schoolteachers, one of them now teaching [illegible]. Miss Thayer amusedly very much about [illegible] in [illegible] and character of an [illegible] from New Hampshire, [illegible] Mrs. Jackson [illegible] her. She rattled off most rapidly in the [illegible] [illegible] about [illegible] of her [illegible], and afterwards told [illegible] of the [illegible] (boys!). She told me she had a few days before acted in [illegible] at Mrs. Jackson's, and she must be a good actor. She is [illegible] sister [illegible] of [illegible] much acquainted with [illegible] (of [illegible]). I hear from various quarters most pleasing accounts of his lady love, her [illegible] and [illegible]. Here Miss Deweys seem to be no near connection of [illegible] although they come from the [illegible] [illegible] their parents did. — Every [illegible] day [illegible] meeting of our club for [illegible] [illegible] but as there are three or four German ladies who come it gives us who do go a good chance [illegible] — Last Saturday we met at Mrs. [illegible] McKenzie, who is, [illegible] younger sister, a native

born German from [illegible] in [illegible]. Mrs. McKenzie is very
big! and [illegible] both [illegible] Miss. [illegible]
[illegible] been studying [illegible] for [illegible]
or so and is now about to go home with her diploma. Miss Bach-
mann was there too, the French teacher in Miss Watson's School. She
was born at Basel in the German Switzerland but educated at Geneva
in French Switzerland and talks French from choice. We had
a talk together and slipped off from the rough complicated German
into the easy-going French, while another couple in the room slipped into
English [illegible] a mixture. Miss Bachmann said she had
been here but six months, [illegible] that she was at Worcester
teaching for some three years, and before that three years at
[illegible] in Miss Russell's School, and had been
at Northampton and [illegible]; and asked after
them. She had also lived perhaps in Boston. She thought a great
deal of [illegible] the country, and liked it better than this,
which shows her taste; but she has not been able to make many [illegible]
[illegible]. She has not perhaps yet found out the fact that
teachers are [illegible] in [illegible] estimation here as they are
in New England, but looked upon rather as a kind of servant
or working people of a rather inferior order.

I think it very likely that I may have to go to Montgomery,
[illegible], very soon to do some good good work in that neigh-
borhood; and [illegible] expect that although I go for a
small matter I may have more work to do there. I
should go [illegible] within a week or ten days.

It seems odd to hear of so much snow in Massachusetts
for [illegible] grass is quite green. It has grown very green in
the [illegible] windows within a couple of days. Yesterday
and day before [illegible] mild days, and the ladies no doubt
found [illegible] satisfactory day yesterday for displaying their
spring [illegible] and finery as it is customary to do here on
Easter Sunday. To-day is very rainy again but not cold. They
let loose yesterday in the Square the English [illegible]
lately imported in hopes of their eating up the cankerworms [illegible]
[illegible]; so we had the singing of birds, that you have probably not enjoyed this year.
Mr. Delano was here last Thursday night and Friday, and [illegible]
the pleasure of breakfasting with him [illegible]
besides. He seemed well but not very gay. [illegible]
[illegible] Give my love to all. Your affectionate [illegible]

125 South Eighth Street, Philadelphia, 29th March [illegible]

My dear Sandborn:

[illegible] This week's Republican came & the other [illegible] no doubt owing to the unusual [illegible]. I noticed several items about [illegible] have not quite equalled the [illegible]. I believe I [illegible] could write [illegible]; and at [illegible] a long letter in which he [illegible] would [illegible] from the [illegible] during [illegible]. He is under the treatment [illegible] in Boston, and now looking very decidedly [illegible] by Dr. Rockwell. [illegible] for [illegible] congestion of the [illegible] caused by [illegible] I noticed nothing [illegible] Mr. Ingram said of [illegible] and was pleased [illegible] I had called [illegible] but I was very tired [illegible] needed [illegible] rested after [illegible]. The [illegible] is afflicted, and [illegible] needed [illegible]. I have told [illegible] will great [illegible] Williamsburg [illegible] to Philadelphia [illegible]. [illegible] I [illegible] that [illegible] would have said [illegible] that [illegible] mind of [illegible] and I found [illegible] Mr. [illegible] could have [illegible] the [illegible]. He is [illegible] [illegible] [illegible]

...he talks very much of you. He is in the yesterday morning and left very freely. He is now in good health and [illegible] restored from the [illegible] of a year or two ago. He does not [illegible] any longer on [illegible], but on the Pacific coast; but I see him pretty often at this office and mine, especially on [illegible] mornings and has taken a lively interest in my numerous projects and inventions. Nibbling, in fact, he is a real source of [illegible] to me. I wrote a little while ago a translation from Arvalid's unfinished novel called Gravey of Pisadingen, and the [illegible] at first before long in the Knickerbocker Journal of Mining where Editor Headley had it a great while. It was [illegible] and then published in book form. This is about mining and quite interesting in its original [illegible] of [illegible]. I expect to read again soon as you do not see the paper. You are so kind as to inquire after the [illegible] and [illegible]. You would laugh if you knew how little I [illegible] have gone down on to paper, and it is hard work while [illegible] attention to it by a paragraph. One of the best if not the very best [illegible] on the subject was announced at Leipzig a fortnight or nine years before it appeared, and now looks a little [illegible]. My violent literary efforts will very likely be [illegible] by a call to the field, namely, to Alabama. The country talks of [illegible] a good deal but work behind it. I am now in daily expectation of hearing something [illegible] affair. It will probably take me only ten days or [illegible] time. This is likely, but I hope for longer sampling me. It will be a pleasant trip there and back by way of [illegible] a reminder of my journeys in the South a dozen years ago. I was in Montgomery [illegible] at such a reception as the [illegible] home to me. Old reputed [illegible] Abolitionist. The [illegible] getting me to go down there is a perfect [illegible] in this state and I [illegible] from this city. It seems to be [illegible] time for big [illegible] and lands in the South, and [illegible] will be immense. [illegible] public [illegible] very [illegible]. In six or eight years [illegible] as [illegible] will [illegible] some satisfactory time, and all the [illegible] things must go well. [illegible] after [illegible] I had an invitation in writing from "Fannie Barmer" to write a [illegible] tale" for her magazine "The Rural" just started here. Knowing [illegible] and [illegible] I [illegible] more [illegible]. [illegible] among the [illegible]. [illegible] R. Stillwell [illegible] and her sister, [illegible] [illegible] meetings of some of my friends or [illegible] [illegible] of yours. Yours truly [illegible]

delay

and

End

[illegible]

[illegible]

No. [illegible] Broadway, [illegible] Street.

Dear Sir,

You gave [illegible] last [illegible] and [illegible]
[illegible] I [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible]

To find the circumference from ellipse.

Multiply the circumference of the circle that has [illegible] half the sum of the two axes of the ellipse by

$$1 + \frac{1}{4}\left(\frac{\text{difference of the two axes}}{\text{sum of the two axes}}\right)^2 + \frac{1}{64}\left(\frac{\text{diff. of the two axes}}{\text{sum of the two axes}}\right)^4 \text{ etc.}$$

For example, an ellipse whose axes are [illegible] feet and [illegible] has circumference of $\frac{10+6}{2} \times 3.1416 \times \left(1 + \frac{1}{4}\left(\frac{10-6}{10+6}\right)^2 + \frac{1}{64}\left(\frac{10-6}{10+6}\right)^4 + \text{etc.}\right) = 8 \times 3.1416 \times \left(\frac{1}{8} \times \frac{1}{16} + \frac{1}{64} \times \frac{1}{256}\right) = 8 \times 3.1416 \times 1.0164 = 25.54$ feet; or neglecting all beyond the [illegible] last [illegible] 25.54 feet. By the rule given the other day [illegible] the length would be 24.72 feet. The difference [illegible] the rules is even greater when the axes of the ellipse are [illegible] equal, and the difference in the [illegible] is even greater when the axes are given in large numbers.

See [illegible] page [illegible].